Microsoft Exchange Server 5.5

Exchange Course Outline

- ## Introduction to Microsoft Exchange

  - Overview of Microsoft Exchange

  - Exchange Server Architecture

  - Designing an Exchange Organization

- ## Installation of Microsoft Exchange

  - Exchange Topology

  - NT Dependencies

  - Services Account

  - Installation Types

Course Outline Cont…

- Exchange Administration and Configuration
    - Microsoft Exchange Server Administrator
    - Creating and Managing Recipients
    - Site Configuration
    - Organization Configuration
    - Exchange Connectors

- Exchange Management and Sustainment
    - Maintaining an Exchange Server Organization
    - Microsoft Exchange Server Monitors
    - Microsoft Exchange Link Monitors
    - Microsoft Exchange Backup and Recovery
    - Best Practices for Microsoft Exchange

Course Outline Cont…

- Exchange Clients
- Microsoft Outlook 2000
    - Profiles
    - Server Based and Offline use
    - Outlook 2000 as a Collaboration tool
- Exchange Server Integration with the Internet
    - Internet Client Access Protocols
    - Lightweight Directory Access Protocols
    - Outlook Web Access

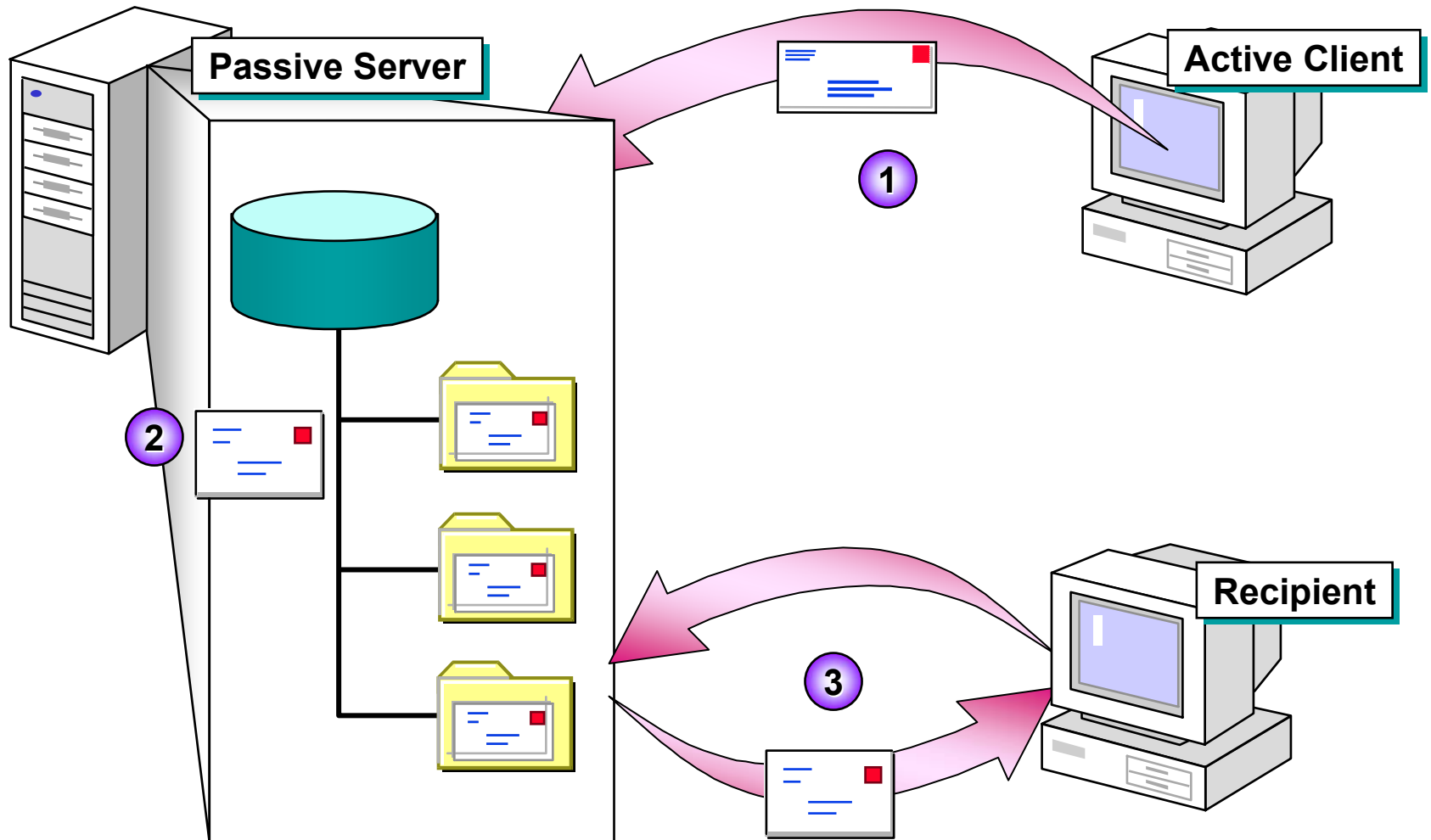# Introduction To Microsoft Exchange Server

Overview of Microsoft Exchange

- Shared–File Messaging Systems

- Client/Server Messaging Systems

- Exchange Server Compatibility

- Windows NT Security Integration
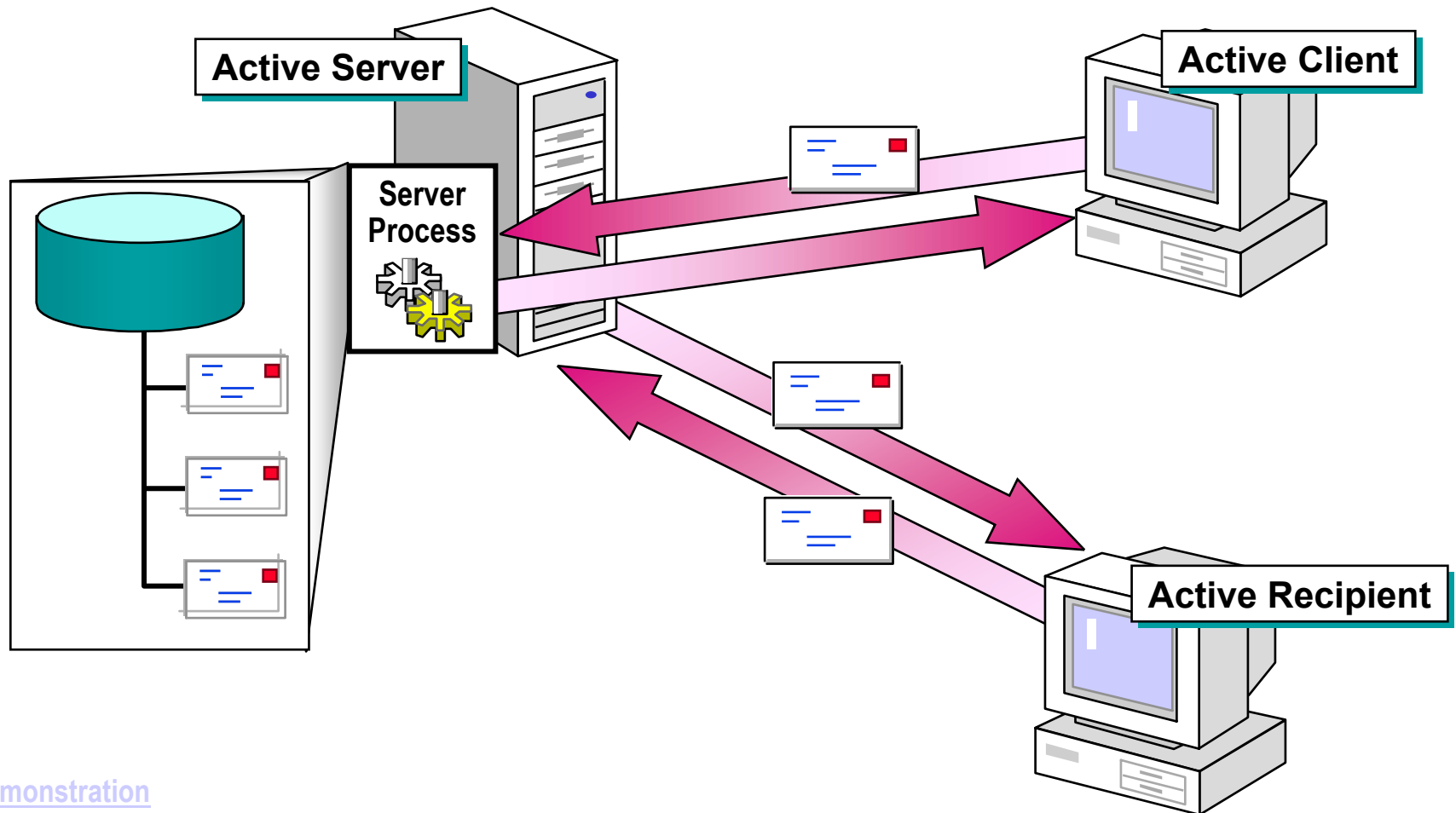
Shared–File Messaging Systems

Passive Server

Active Client

1

2

Recipient

3

Client/Server Messaging Systems

Active Server

Active Client

Server Process

Active Recipient

Demonstration

6

Exchange Services

- Services that are provided by Exchange:

  - Data Storage

  - Directory Storage

  - Comm between sites and other mail systems

  - Data replication

  - Mail delivery

  - Administration

Exchange Server Compatibility

- Support for messaging Standards
  - X.400
  - X.500
  - Internet
  - MAPI
- Support for Client Operating Systems.
  - NT
  - Windows 2000, 98, 95, and 3.X
- Exchange Coexistence with other Messaging systems.
  - Netware
  - Unix
  - Apple Talk

Security & Integration

- ## Secure Single Log on
  - Must run on an NT Server
  - Utilizes NT Access Control Lists (ACLs)
- ## Discretionary Access Control
  - Private Information Store
  - Public Information Store
- ## Auditing
  - Significant events
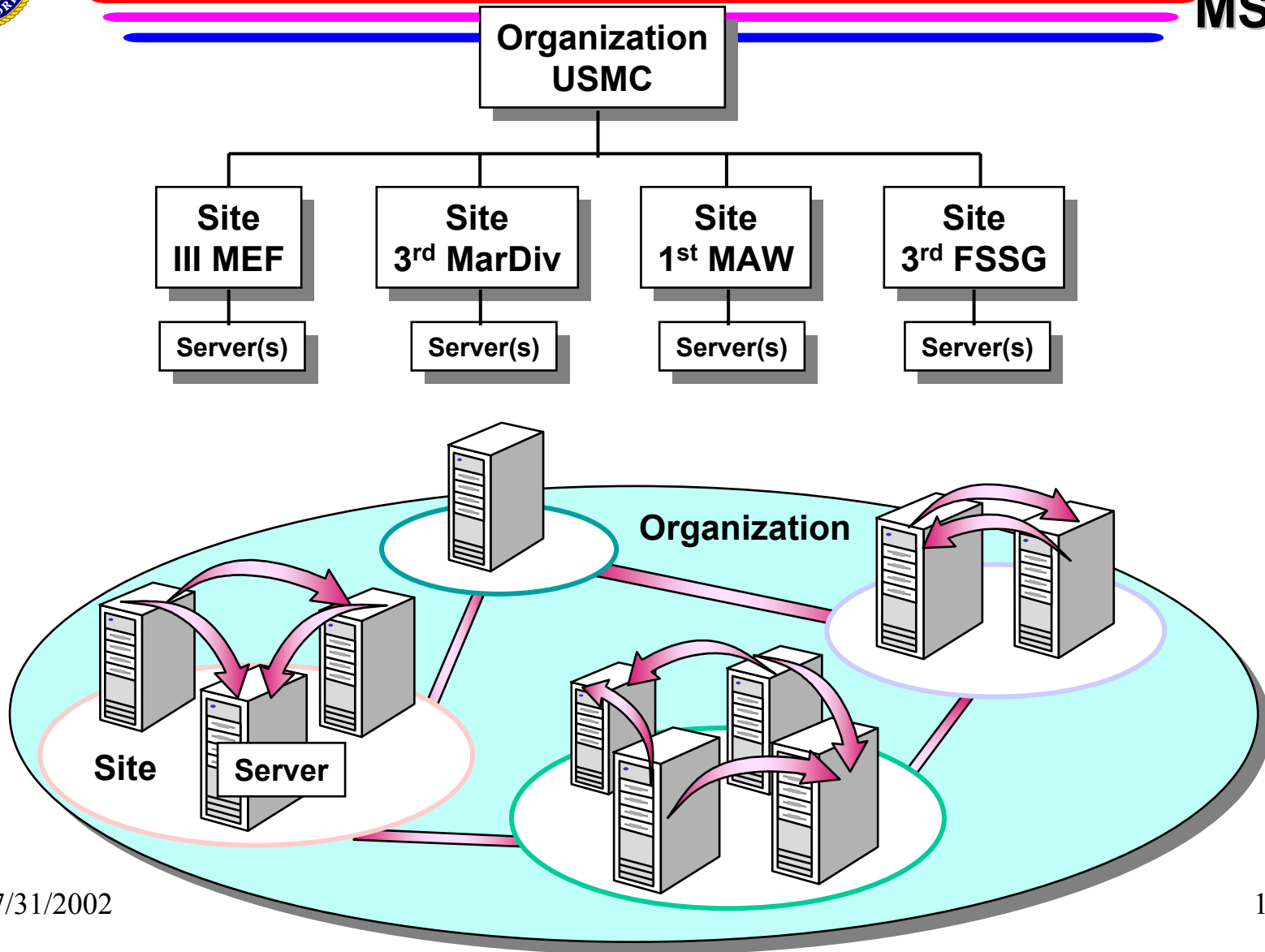 - Services & Directory objects

Exchange Server Architecture

MSTP

- ORGANIZATION
  - Only One Organization
- SITE
  - Many sites in an Organization
  - Communicate via connectors
- Servers
  - Many servers in site
  - Contain server recipients

Exchange Server Hierarchy

Organization
USMC

| Site III MEF | Site 3rd MarDiv | Site 1st MAW | Site 3rd FSSG |

Server(s) — Server(s) — Server(s) — Server(s)

Organization

Site **Server**

Hierarchy Details…

- ## Organization
  - The Exchange organization comprises all the Exchange Servers that have the same property value in the field Organization
  - Once installed it cannot be changed
  - Organization is inherited from an existing server if joining a site
  - Often set to the company name; however, since the value cannot change it must be considered carefully

Hierarchy Details Cont…

- Site
  - The Exchange Site is defined as a series/grouping of Exchange Servers that are logically connected and participate in automatic exchange of data via RPCs (remote procedure calls)
  - Directory information of all servers within the site are automatically replicated to each other.
  - Available bandwidth between Exchange servers is always a consideration when planning a site.
    - Bandwidth must be able to support RPC (typically Microsoft has quoted the minimum figure as 56kb).
    - No control over the inter-server comm within the site

Hierarchy Details Cont...

- Exchange Servers
  - Bridgehead Server
    - Typically the first installed within a Site
    - Directory replication between sites
    - Maintains the Gateway Address Routing Tables
  - All others
    - Hold local users mailboxes
    - Hold public folders
    - Support server connectors between sites
  - Communications

Component Communications

- ## Core Components
  - System Attendant
  - Directory Service
  - Message Transfer Agent
  - Information Store

- ## Additional Components
  - Provide additional communications capabilities

Core Components

System Attendant

Directory Service
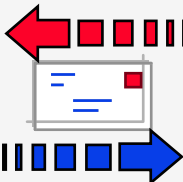
Message Transfer Agent (MTA)
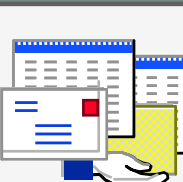
Information Store Public / Private

System Attendant (SA)

- Generation of all new email addresses

- Checks directory store database consistency

- Builds routing tables

- Used for tracking messages and logging

Directory Service

- Controls the Directory Database (dir.edb)
  - Lists all objects in an Exchange Server
  - Public folders
- Acts as phone book for Exchange Site
- Based on directory services standard (ISO X.500)
- Only initiates directory replication

Message Transfer Agent (MTA)

- Determines routing of messages

- Sends mail out of an Exchange Server or Site

- Expands Distribution Lists
  - Calls DS to expand and then makes routing decision

- Talks to system attendant
  - Used for logging

Information Store

- Controls two databases (no limit in size)
  - priv.edb
    - Private Info Store messages are addressed to the user
  - pub.edb
    - Info for users to browse
- Delivers mail to users on same exchange server
- Enforces storage limits
- Replicates Public Folders

Additional Components
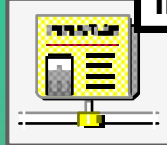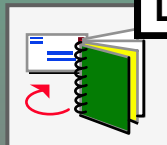
Internet Mail Service	Outlook Web Access
Internet News Service	Connector for Lotus cc:Mail Connector for Lotus Notes
Microsoft Mail Connector	Key Management Server
Directory Synchronization	EDK-Based Connectors
Schedule+ Free/Busy Connector	Event Service
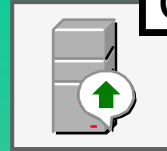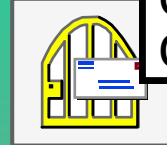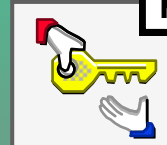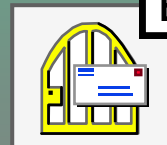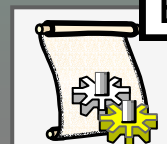
Exchange Server Recipients

- There are Five types of Recipients
  - Mailbox (Inbox)
  - Custom Recipient
  - Distribution List
  - Public Folder
  - Hidden Recipient

Designing Exchange Topology

- Who are your users
- What type of Network do you have
- What type of NT Domain do you have
- What type of Naming Strategy do you have
- How are you going to link your sites
- What type of Public folder infrastructure do you have
- Other Considerations
- Review your plan

Creating a Geographic Profile

Geographic Profiles Include:

- Locations
- Major Network Connections and Topology
- Exchange Server Sites
- Number of Users
- Connection Types Between Sites
- Public Folder Topology

Pentagon

Panama

Naming Strategy

- ## Choosing an Organization Name
  - Maximum of 64 characters, case sensitive

- ## Assigning Site Names
  - Maximum of 64 characters, case sensitive

- ## Creating Unique Server Names
  - Maximum of 15 characters, with character restrictions

Planning for Exchange

MSTP

Directory Replication Connector

MEF CE

CPP

Messaging Connector

BASE

MEF

DIVISION

Internet
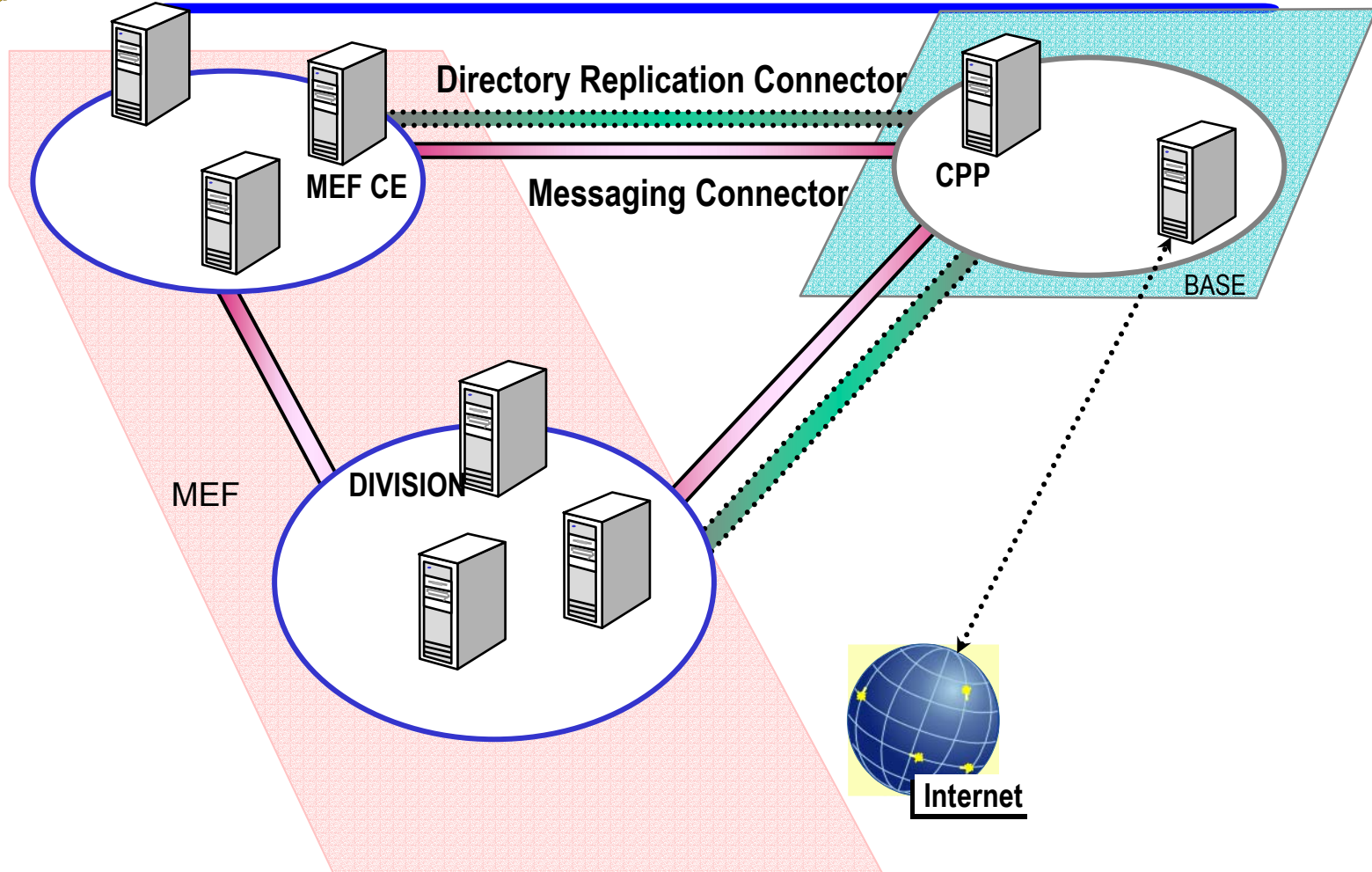
Installation

of
Microsoft Exchange
Server

Installation of MS Exchange

- Preparing for an Exchange Installation

- Organizational Contexts for Installation

- Post-Installation Considerations

- Common Installation Issues

- Exchange Server Service Dependencies

- Installation Optimization

Preparing for Installation

- System Requirements
  - Exchange Server Enterprise Edition (SP-3)
  - NT Server Version 4.0 (SP-6)
  - TCP/IP
  - Microsoft Internet Information Server 4.0
- Hardware Requirements
  - P60 or faster
  - 150 MB of disk space
  - 24 MB RAM

Preparing for Installation Cont...

- Windows NT Dependencies
  - Windows NT Permissions
  - Site Services Account
    - Logon as a Service
    - Restore Files and Directories
    - Act as Part of the Operating System
  - Exchange Server Permissions
    - Exchange Admin account

Services Account

Site Services Account

Choose the services account and type the password.

Account Name: DOMAIN\exservice   Browse...

Account Password: ********

OK   Exit Setup   Help

• Run User Manager for Domains to create the account, switch back to Setup, and then proceed with the installation process.

Preparing for Installation Cont…

- Types of Installations:
  - Typical
  - Complete/Custom
  - Minimum
- Three scenarios:
  - Creating a New Site
  - Adding a Server to an Existing Site
  - Upgrading a Server Within a Site

Adding a Server to an Existing Site

- Reasons for Joining an Existing Site
  - Creating a dedicated server
  - Scaling
  - Replacing an Existing Server
- Windows NT Security Requirements

Installation

Run

Type the name of a program, folder, or document, and Windows will open it for you.

Open: E:\SETUP\I386\Setup.exe

☑ Run in Separate Memory Space

OK   Cancel

Microsoft Exchange Server Setup

Welcome to the Microsoft Exchange Server Setup program.

Setup cannot install system files or update shared files if they are in use. Before proceeding, we recommend that you close any applications you may be running.

For information on closing applications without exiting Setup, choose Help.

WARNING: This program is protected by copyright law and international treaties.

Unauthorized reproduction or distribution of this program, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under law.

OK   Exit Setup   Help

Types of Installation

Choose the type of installation by clicking one of the following buttons. ✕

Typical

Microsoft Exchange Server will be installed with the most common options.

Complete/Custom

Microsoft Exchange Server will be installed with only the options you select.

Minimum

Microsoft Exchange Server will be installed with the minimum required options to run.

Directory:

C:\exchsrvr

Change Directory

Exit Setup

Help

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Post-Installation Considerations

- Optimizing the Server

- Default File Locations/Structure

- Share Point Permissions

- Installing Only the Administrator Program

Optimizing the Server

Microsoft Exchange Server Setup   ☒

Microsoft Exchange Server Setup has completed successfully.

You can now optimize your Exchange Server installation for this specific machine by running the Exchange Server Optimizer. The Optimizer can also be run at a later time.

[Run Optimizer]   [Exit Setup]

•Run the Performance Optimizer Wizard

Default File Locations/Structure

- Exchsrvr
  - Addins
  - Address
  - Bin
  - Ccmcdata
  - Connect
  - Dsadata
  - Dxadata
  - Imcdata
  - Insdata
  - Mdbdata
  - Mtadata
  - Res
  - Sampapps
  - Tracking.log
  - Webdata

Share Point Permissions

Exchsrvr

- Add-ins
- Address
- Connect
  - Msmcon
    - Maildata
- Res
- Tracking.log
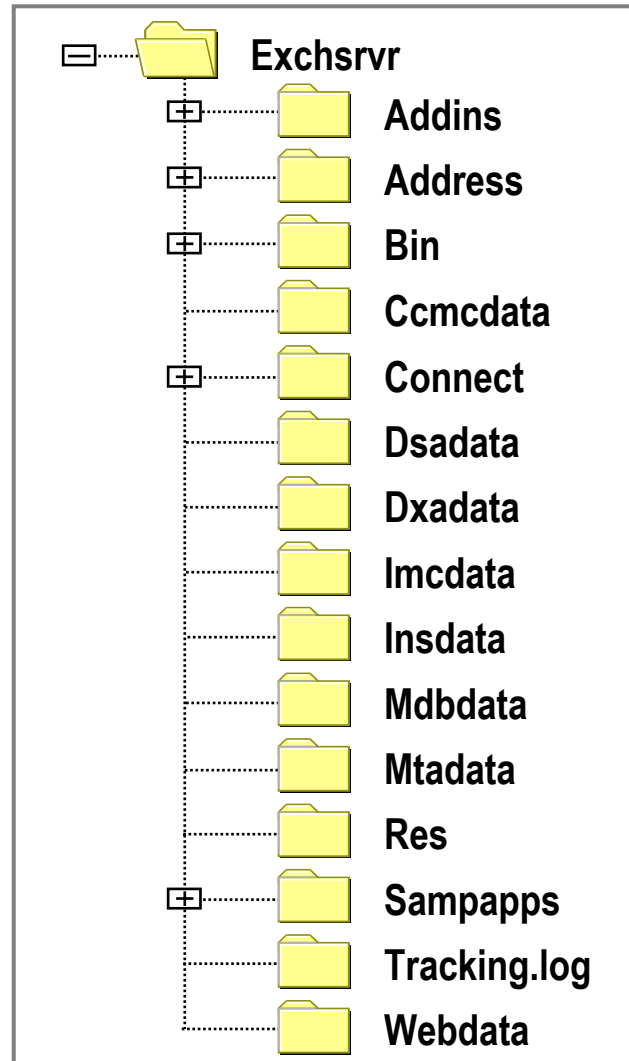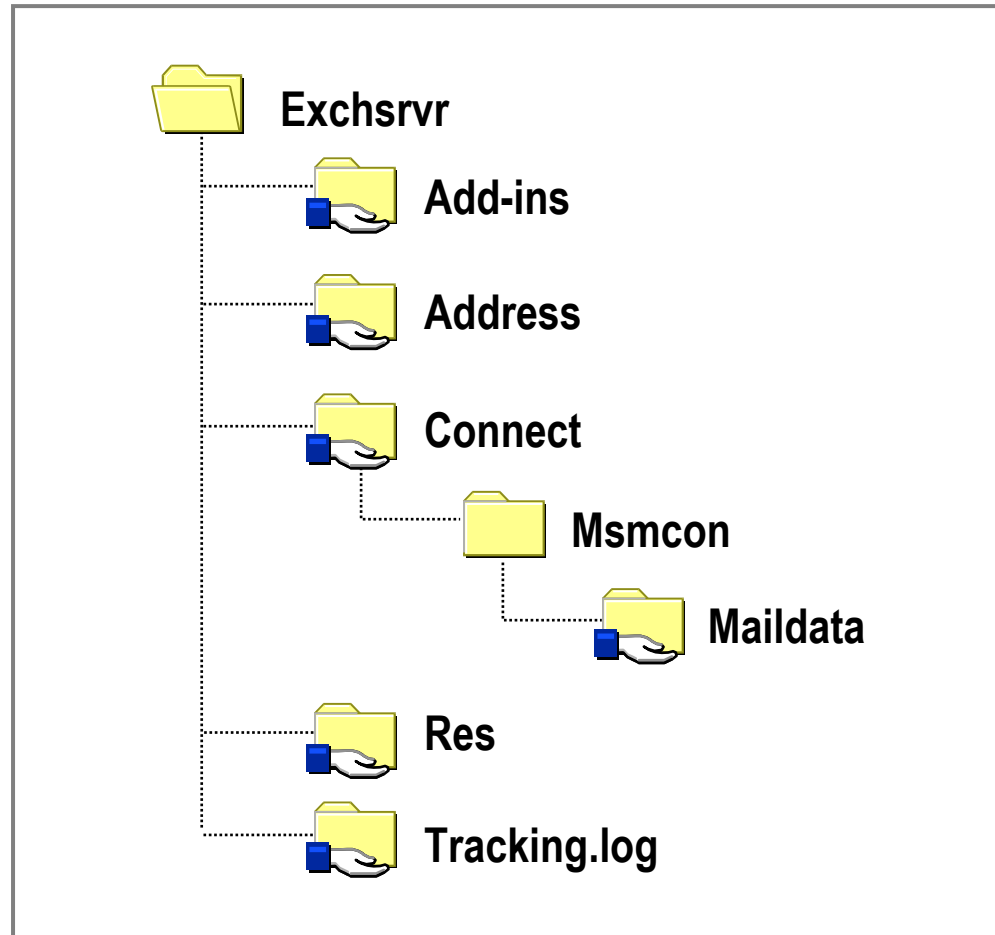
Installing the Administrator Program

Microsoft Exchange Server Setup - Complete/Custom ☒

In the Options list, select items you want installed; clear items you do not want installed.

If you want to install only part of the selected option, choose Change Option.

Options:

☑ Microsoft Exchange Server	102608 K	
☑ Microsoft Exchange Administrator	6304 K	
☑ Books Online	8288 K	
☑ Outlook Web Access	14464 K	

Description:

All components required for a fully configured Microsoft Exchange Server

[Change Option...]

Directory for Currently Selected Option:

C:\exchsrvr

[Change Directory...]

Space Required on C: 131664 K
Space Available on C: 1746080 K

[Continue]   [Cancel]   [Help]

Exchange Administrator Tour

MSTP

Microsoft Exchange
Lab #1

Installation

45 Minutes

Exchange Administration and Configuration

Parts 3 & 4

- Exchange Administration and Configuration
    - Microsoft Exchange Server Administrator
    - Creating and Managing Recipients
    - Site Configuration
    - Organization Configuration
    - Exchange Connectors

- Exchange Management and Sustainment
    - Maintaining an Exchange Server Organization
    - Microsoft Exchange Server Monitors
    - Microsoft Exchange Link Monitors
    - Microsoft Exchange Backup and Recovery
    - Best Practices for Microsoft Exchange

Planning for Exchange

MSTP

Directory Replication Connector

MEF CE

CPP

BASE

Messaging Connector

MEF

DIVISION

Internet

Exchange Admin and Conf

- Exchange Server Administrator

- Creating and Managing Recipients

- Site Configuration

- Organization Configuration

- Exchange Connectors

Exchange Administrator Tour

MSTP

Exchange Server Recipients

- There are Five types of Recipients

  - Mailbox

  - Custom Recipient

  - Distribution List

  - Public Folder

  - Hidden Recipient

Mailbox

7/31/2002

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Distribution List

Custom Recipient

Hidden Recipients Cont…

MSTP

Hidden Recipients

Select "View," then "Hidden Recipients" to see all hidden mailboxes.

Server Configuration Objects

MSTP

Configuring Server Properties

MSTP

Private Information Store

Private Information Store Properties   ✕

| General | Logons | Mailbox Resources | Diagnostics Logging |

Private Information Store

Item Recovery

Deleted item retention time [days]: 10

☐ Don't permanently delete items until the store has been backed up.

Storage limits

☑ Issue warning (K):   100000

☑ Prohibit send (K):   110000

☑ Prohibit send and receive [K]: 115000

Public folder server

MQGCAI02 ▼

| Created | Home site: | MSTP | Last modified |
| 5/14/1999 6:22 PM | Home server: | MSTP02E | 8/29/2000 2:47 PM |

7/31/2002

OK   Cancel   Apply   Help

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Public Information Store

7/31/2002

Protocols Container

Protocols Properties   ×

General | Permissions | Connections | MIME Types |

Protocols

Display name: | Protocols |

Directory name: | Protocols |

☑ Use site defaults for all properties

Outlook Web Access Server Name:

| |

Administrative note:

| |

Created   Home site: MSTP   Last modified
5/14/1999 6:22 PM   8/20/2000 2:26 AM

OK   Cancel   Apply   Help

Directory Services Object

Directory Service Properties   ×

General | E-mail Addresses | Diagnostics Logging

Directory Service

Update this directory from within this site: [Update Now]

Check knowledge consistency: [Check Now]

Administrative note:

[   ]

Created   Home site: MSTP   Last modified
5/14/1999 5:14 PM   5/14/1999 6:22 PM

[OK]   [Cancel]   [Apply]   [Help]

Message Transfer Agent Object

MSTP

System Attendant Object

System Attendant Properties

General | E-mail Addresses

System Attendant

Display name: System Attendant

Alias name: MSTP02E-SA

Message tracking log files maintenance

○ Do not remove old log files

◉ Remove log files older than 7 days

Administrative note:

Created   Home site: MSTP   Last modified
5/14/1999 6:22 PM   Home server: MSTP02E   5/14/1999 6:22 PM

OK   Cancel   Apply   Help

Site Configuration Options

MSTP

Site Configuration Options

MSTP

Site Configuration

- Configuration container includes:
  - Add Ins
  - Addressing
  - Connections
  - Directory Replication
  - Monitors
  - Protocols
  - Servers
  - DS-Site Connector
  - Information Store Site Configuration
  - MTA Site Configuration
  - Site Addressing
  - Site Encryption Configuration

Site Configuration Container

MSTP

Configuring Site Objects

- DS Site Configuration

- Information Store Site Configuration

- MTA Site Configuration

- Site Addressing

DS Site Configuration

DS-Site Connector Properties

Tabs: Offline Address Book | Custom Attributes | Attributes | General | Permissions | Offline Address Book Schedule

DS-Site Connector

Display name: DS-Site Connector

Directory name: Site-DSA-Config

Tombstone lifetime (days): 60

Garbage collection interval (hours): 12

Anonymous access

Anonymous account

Password:

Confirm Password:

Created 12/31/1997 2:12 PM   Home site: MSTP   Last modified 8/21/2000 10:30 AM

OK | Cancel | Apply | Help

Information Store Site Configuration

Information Store Site Configuration Properties   ✕

| Storage Warnings | | Public Folder Affinity |
| General | Permissions | Top Level Folder Creation |

Information Store Site Configur...

Display name: Information Store Site Configuration

Directory name: Site-MDB-Config

Public folder container

[   ]

Modify...

☐ Enable message tracking

Created   Home site: MSTP   Last modified
12/31/1997 2:12 PM   6/30/2000 3:33 PM

7/31/2002

OK   Cancel   Apply   Help

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MTA Site Configuration

MTA Site Configuration Properties

General | Permissions | Messaging Defaults

MTA Site Configuration

Display name: MTA Site Configuration

Directory name: Site-MTA-Config

☑ Enable message tracking

Created
12/31/1997 2:12 PM

Home site: MSTP

Last modified
5/28/1998 4:36 PM

OK | Cancel | Apply | Help

Site Addressing Configuration

MSTP

Site Addressing Properties

General | Permissions | Site Addressing | Routing Calculation Schedule | Routing

Site Addressing

Display name: Site Addressing

Directory name: Site-Addressing

Routing calculation server: MQGCAI02

☐ Share address space with other X.400 systems

Created
12/31/1997 2:12 PM

Home site: MSTP

Last modified
8/29/2000 2:42 PM

OK | Cancel | Apply | Help

Organization Configuration

- USMC (Organization Name)
  - Address Book Views
  - Folders
    - Public Folders
    - System Folders
      - EFORMS Registry
      - Events Root
      - Offline Address Book
      - Schedule + Free Busy
  - Global Address List
  - Sites

Exchange Connectors

Exchange Connectors

- Component Communication
  - Core Components Communication
    - The four minimum components required to run on the server.
  - Administrator Program Communication
    - Control and configuration of all core and additional server components
  - Client Program Communication
    - User access to the Private and Public Information Stores and Directory Service.

Core Component Communications

Directory Service	Information Store	MTA	System Attendant

MSTP

7/31/2002

Additional Components Communication

Clients

Administrator Program

Core Components

Information Store

Directory Service

System Attendant

MTA

KM Server

Internet Mail Service

Outlook Web Access

Internet News Service

EDK-Based Connectors

Event Service

Directory Synchronization

MS Mail Connector

Schedule+ Connector

Client Program Communication

MSTP

Clients

MAPI

POP3

IMAP4

HTTP

IIS Server

Information Store

Directory Service
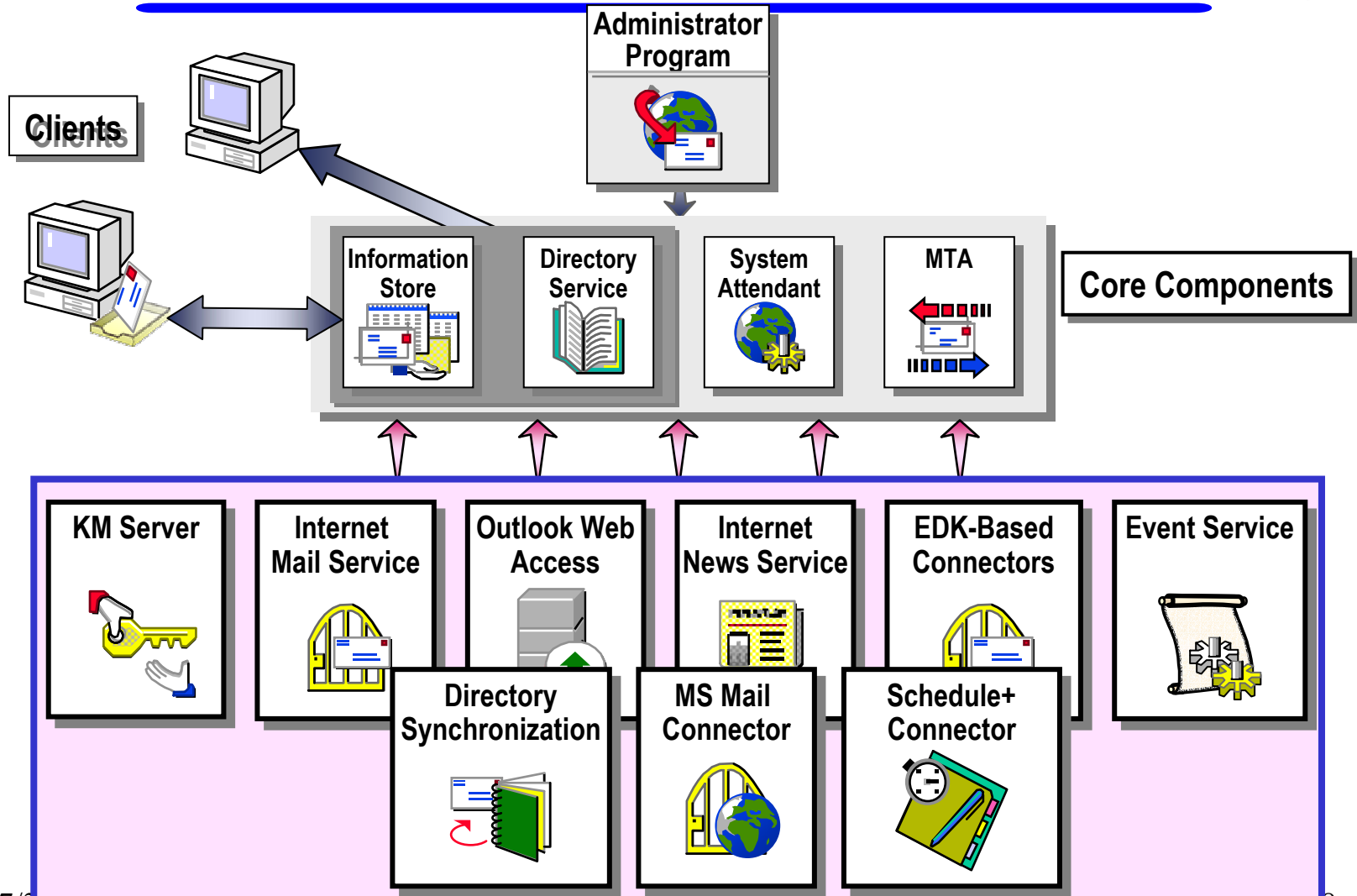
Core Components

LDAP
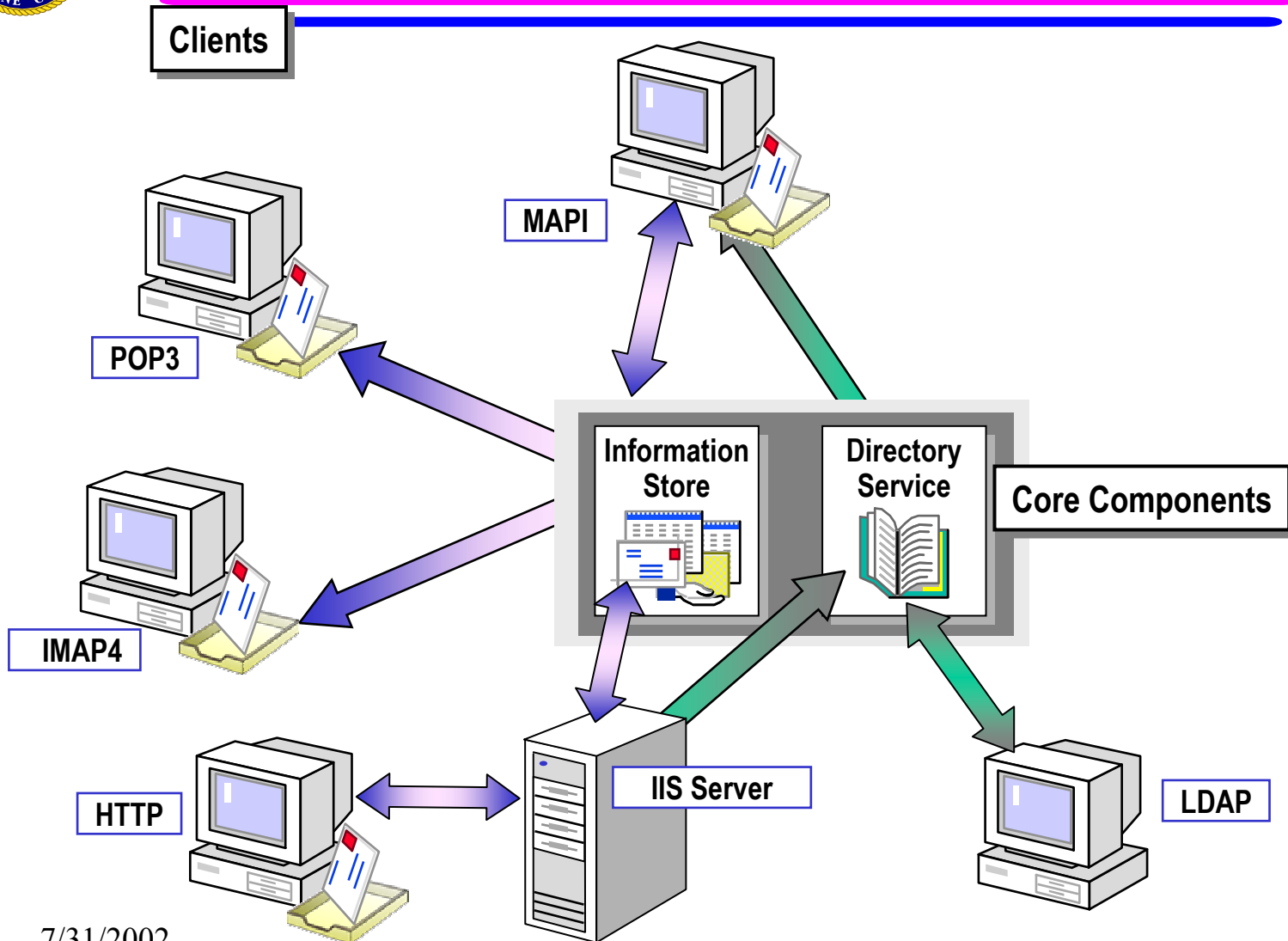
Intrasite Server Communication

- Servers Within a Site Communicate by Using RPCs
  - All server components use RPCs to distribute data directly to the corresponding on the other servers in the site.

- Transferring Information
  - The Directory Service and MTA manage the transfer of information within an Organization.

- Store and Forward
  - If the destination server is unavailable, the originating server stores the information.

Single Server Communications

Single Server

Exchange Server

Information Store

Client 1

Client 2

1

2

3

notification

Message Retrieval
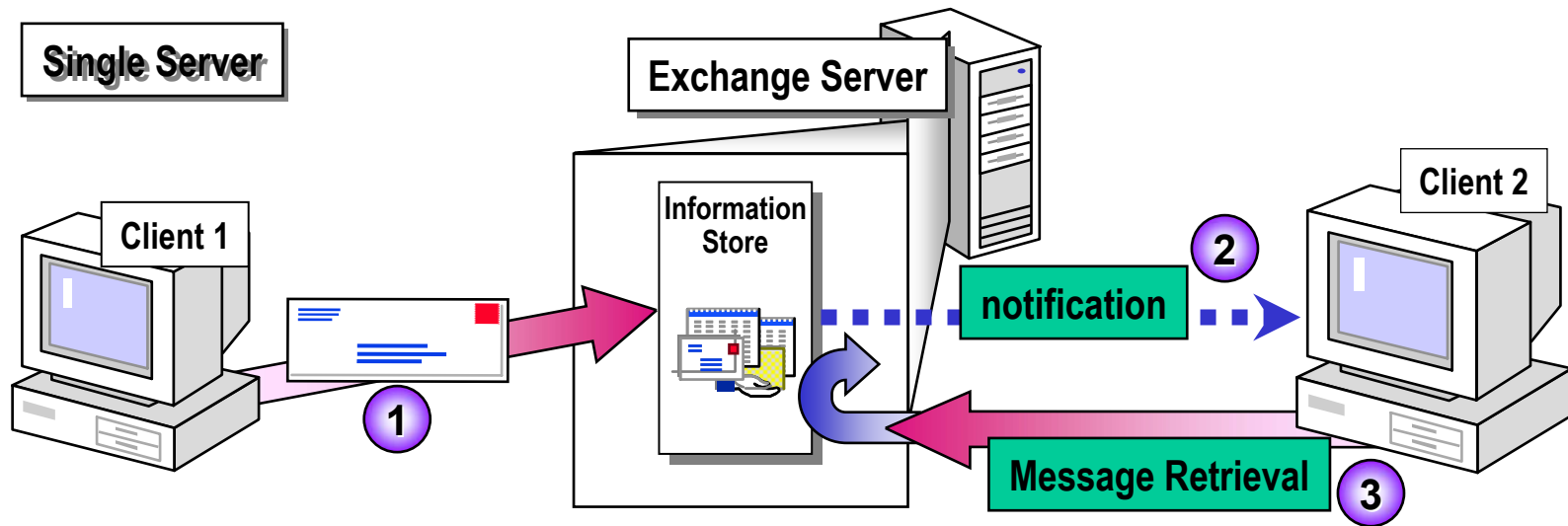
Multi Server Communication

Multiple Servers
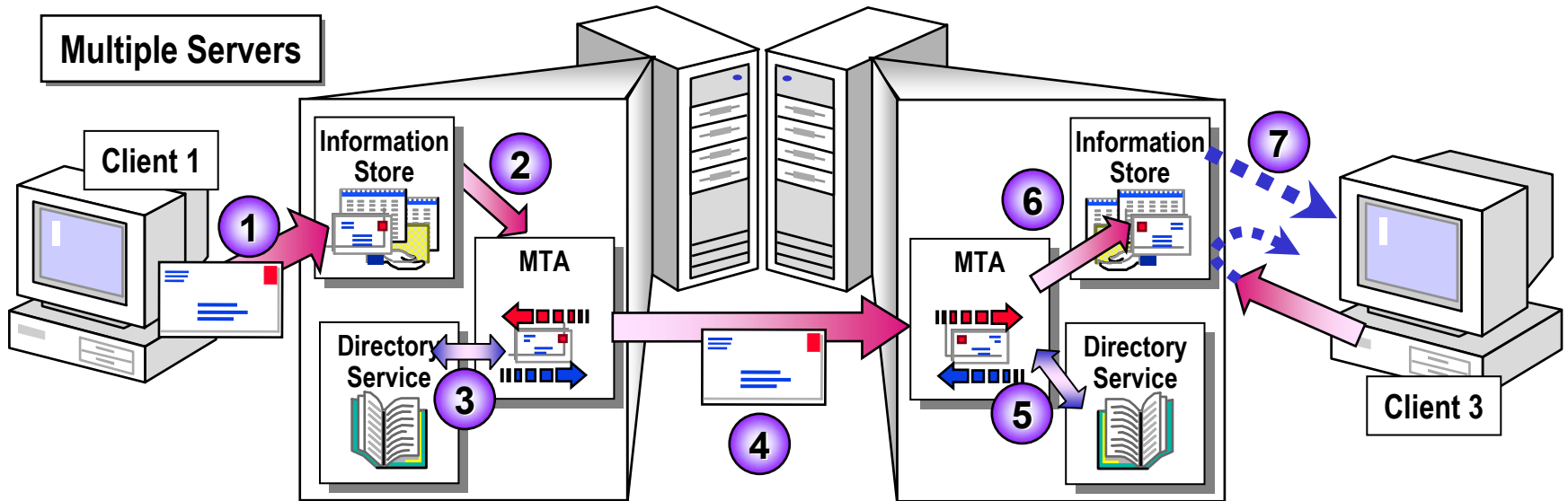
Client 1

Information Store

1

2

MTA

Directory Service

3

4

MTA

6

Information Store

7

5

Directory Service

Client 3

Message Transfer Agent (MTA)

- Determines routing of messages
- Sends mail out of an Exchange Server or Site
- Expands Distribution Lists
  - Calls DS to expand and then makes routing decision
- Talks to system attendant
  - Used for logging

Procedures to Send a Message

- The MTA looks up the recipient's home server from the Directory Service.

- The MTA checks to see if it must route the message outside the site.

- The MTA uses the Site Services account (security context) to open an RPC session to the destination MTA. (called an association).

- The MTA uses the association to send the message to the destination server.

- When message transmission is complete, the receiving MTA uses its local Directory Service to look up the recipient, and then determines if the message should be sent to another server.

- If the message is intended for the local server, the MTA places the message in a queue then notifies the Information Store.

- The Information Store retrieves the message from the MTA and notifies the recipient.

MTA Process

MTA and Routing

Message Submitted

1 Retrieve Addressing Information

2 Is the recipient a DL? — **Y** → Expand DL and re-enter process for every member

N

3 Is address a Custom Recipient? — **N** → **4** Does the address match local site? — **Y** → **5** Is recipient's home MTA this MTA? — **Y** → Deliver message to Local IS

Y (from box 3)

Examine DDA and route to appropriate connector using Routing and Selection

N (from box 4)

Examine address and route to appropriate site using Routing and Selection

N (from box 5)

Transfer message to home MTA

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Intrasite Comm Between Services

MSTP
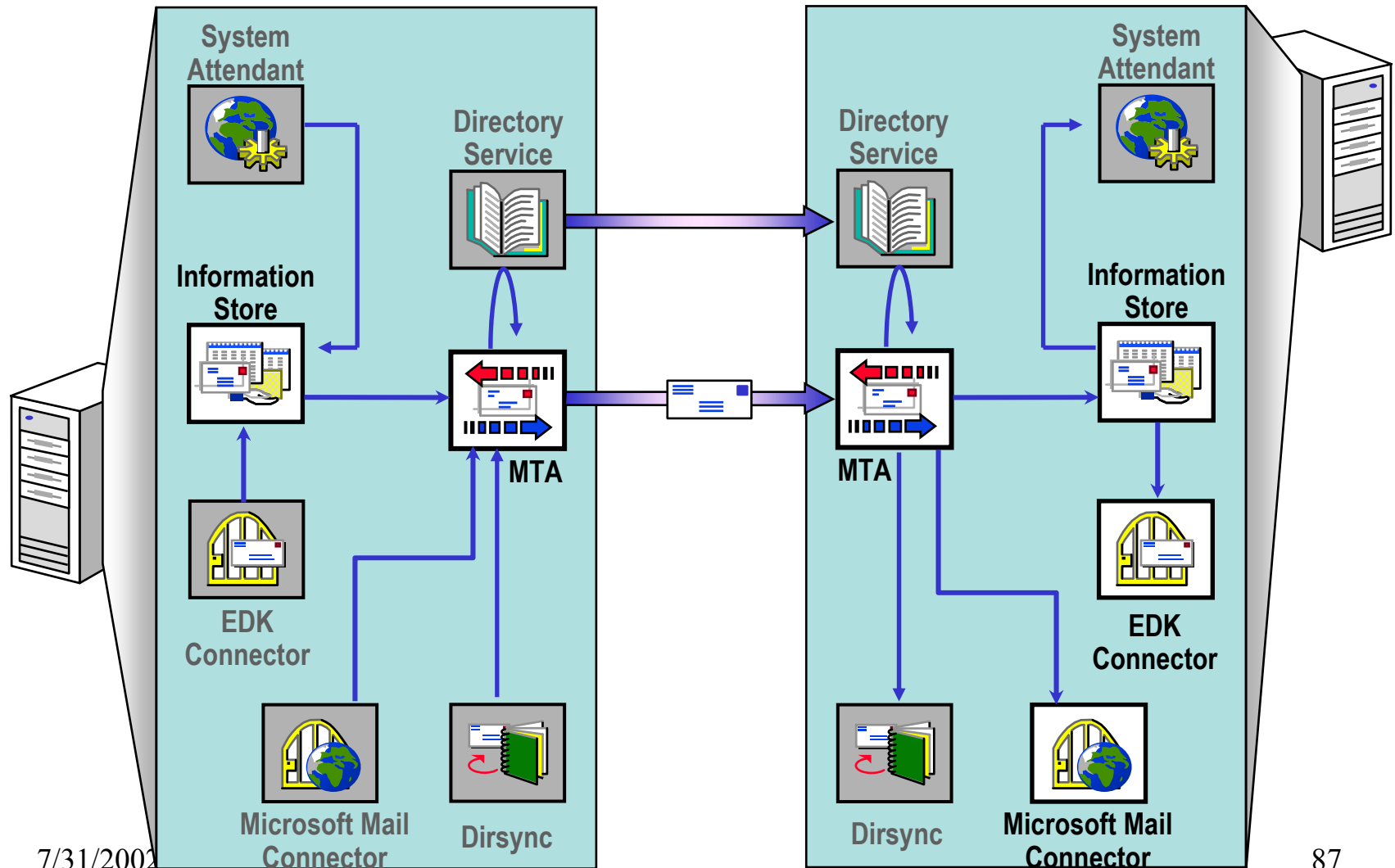
Directory Service Process
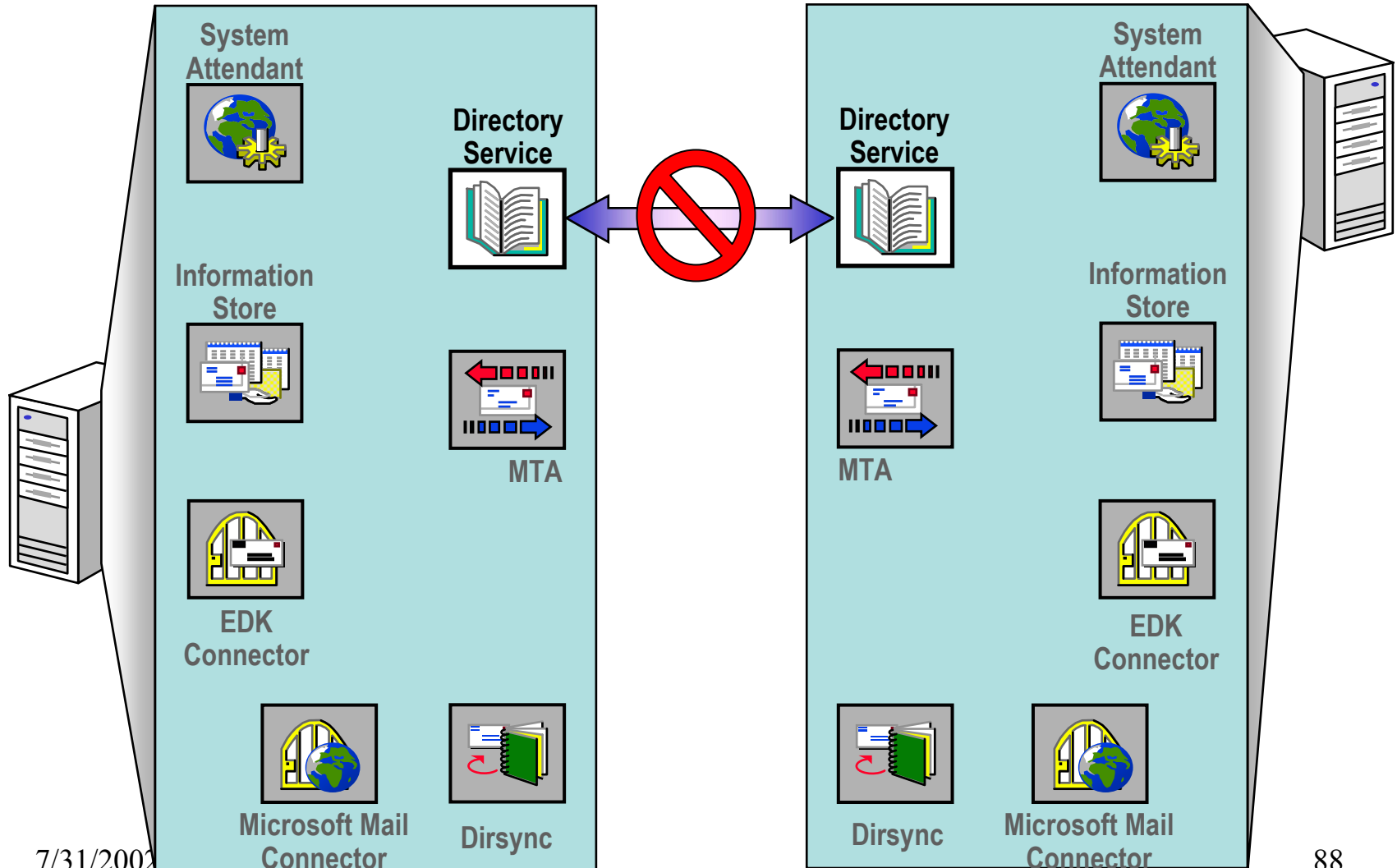
Information Store

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    - Private Info Store messages are addressed to the user
  - pub.edb
    - Info for users to browse
- Delivers mail to users on same exchange server
- Deleted Item Retention
- Enforces storage limits
- Replicates Public Folders

Information Store Process
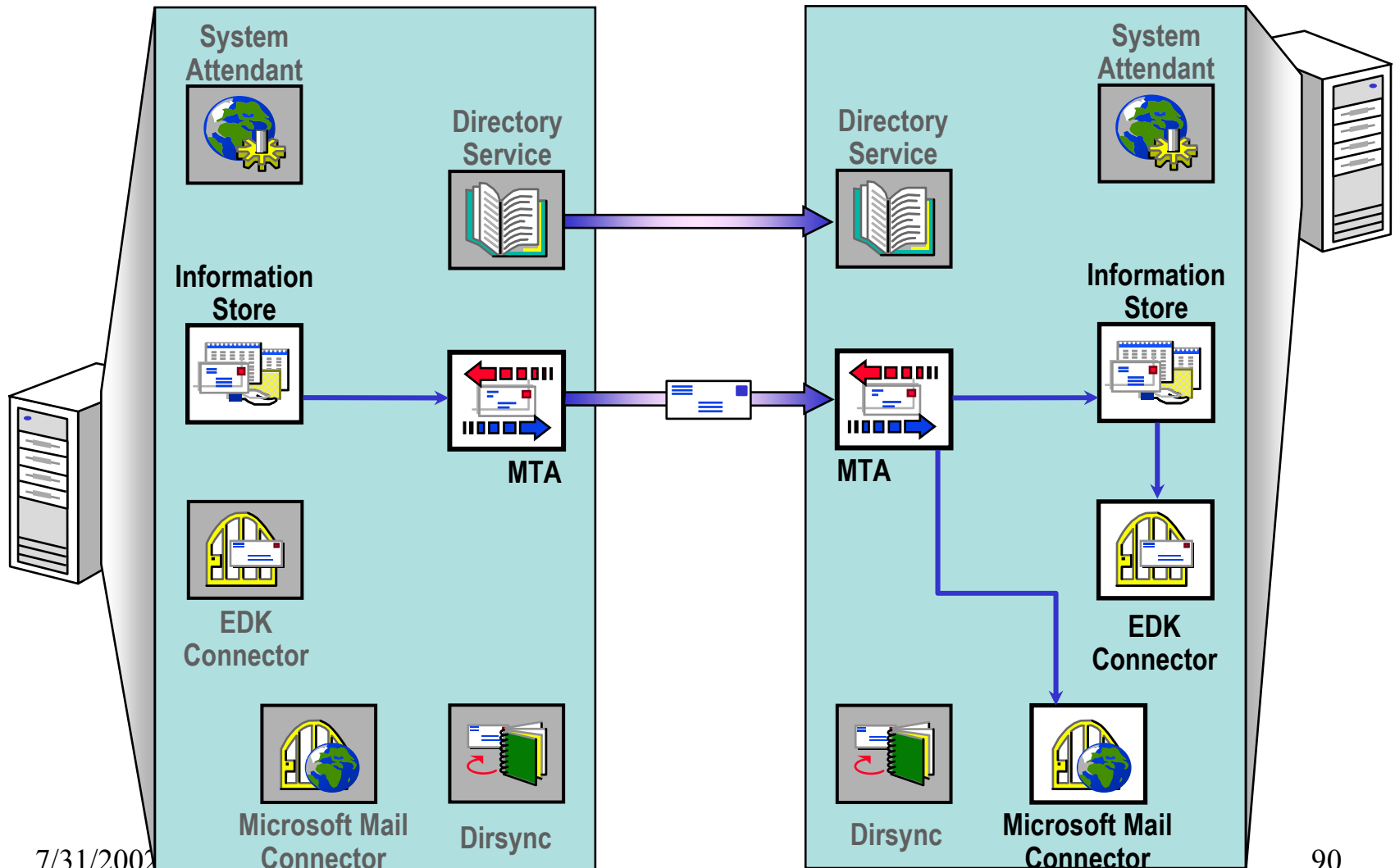
System Attendant Process
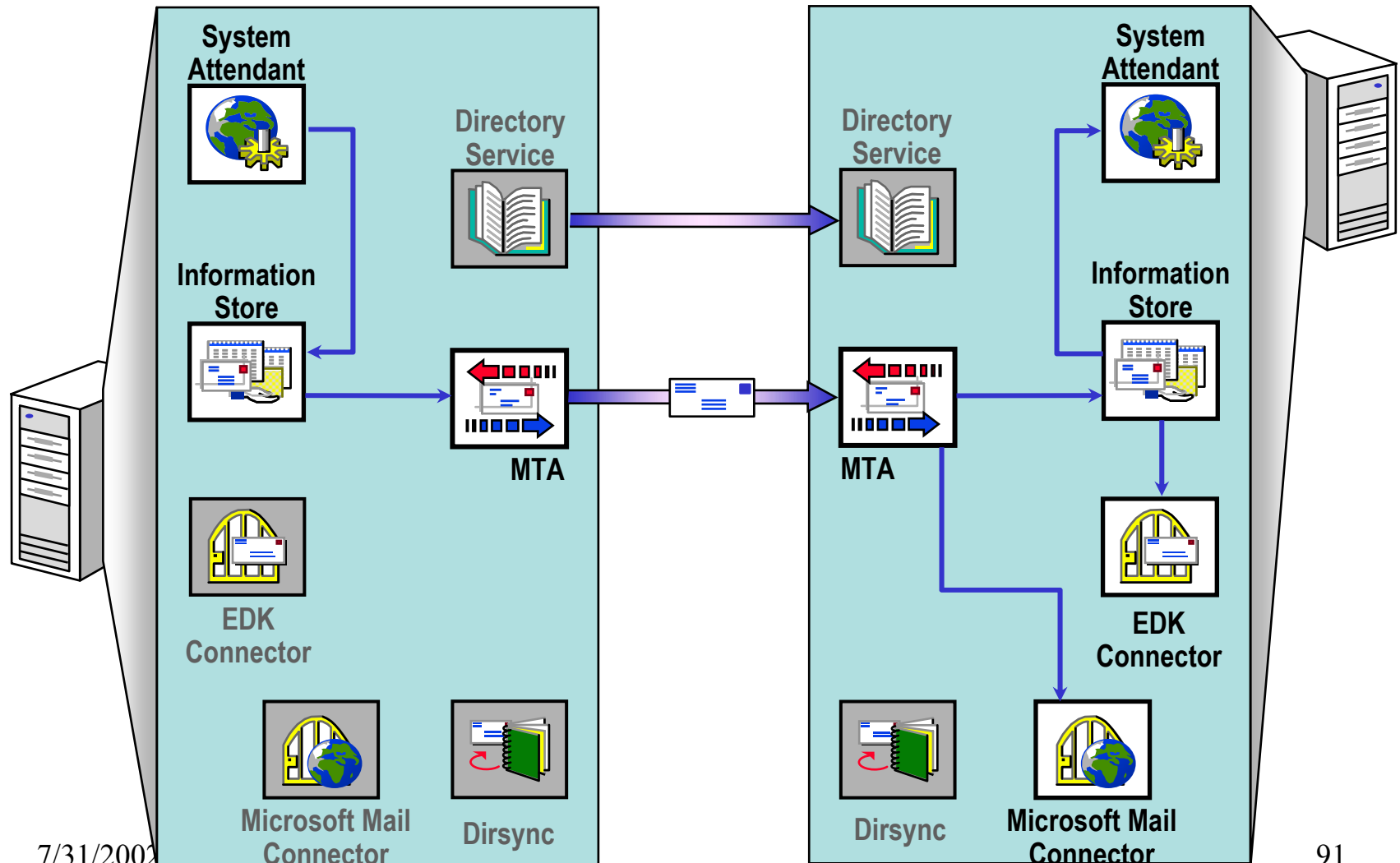
Connectors Communication Process

MSTP

- Internet Mail Service
- Connector for Lotus cc:Mail
- Connector for Lotus Notes
- Third-Party Connectors

System Attendant

Directory Service

Information Store

MTA

EDK Connector

Microsoft Mail Connector

Dirsync
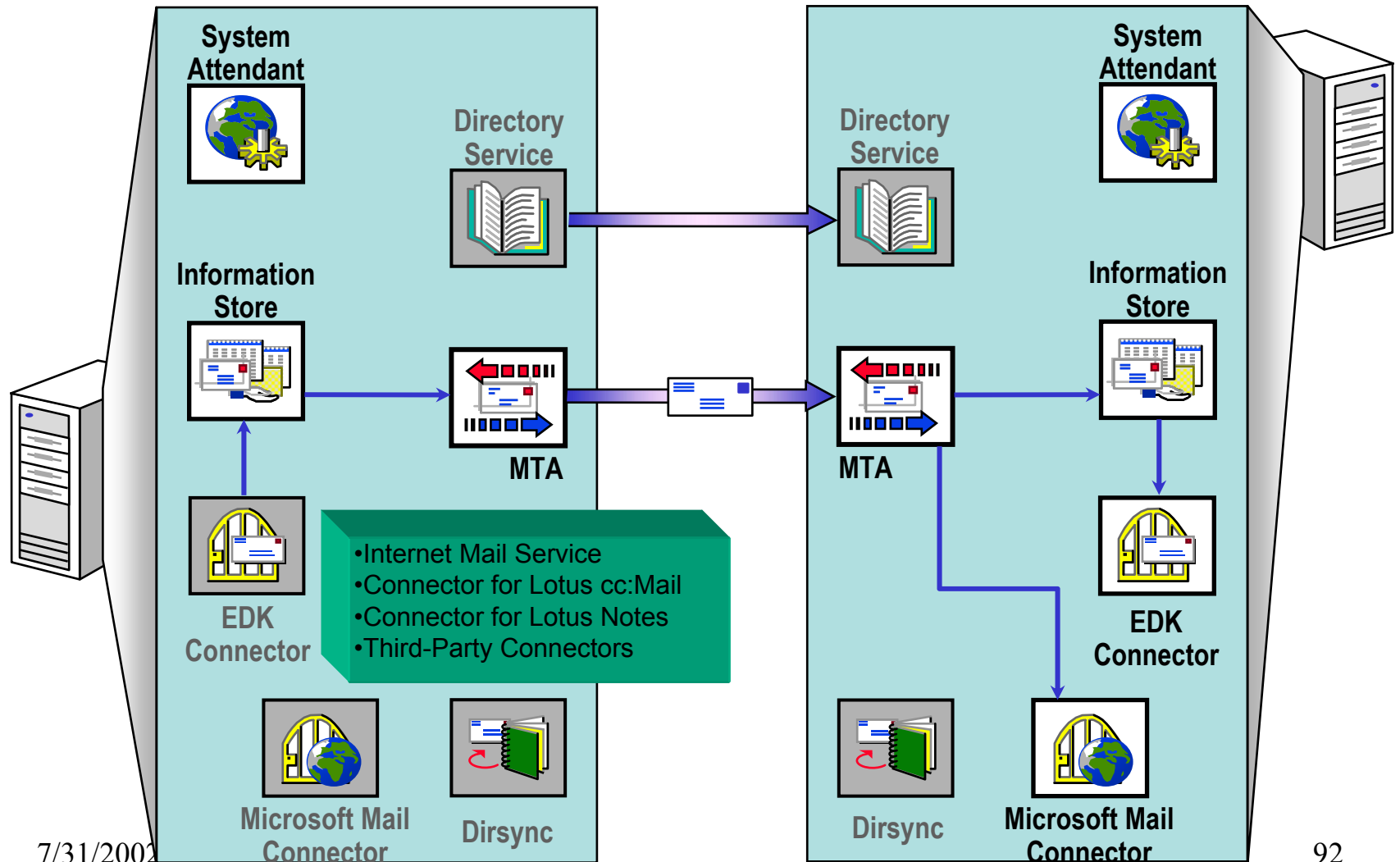
Site Connectors

- Connects only Exchange sites
- Uses RPC as the communication mechanism
- Can be configured to
  - Operate *from* one or many servers in the site
  - Operate *to* one or many servers in the destination site

Configuring Site Connector

- Site Connector Configuration Issues
  – Bandwidth
  – Network Topology
- Site Connector Tabs
  – General
  – Target Servers
  – Address Space
  – Override

Operations with Site Connectors

Target Servers

Site X

Site Y

- OR -

Target Server

Site X

Site Y

Messaging Bridgehead Servers
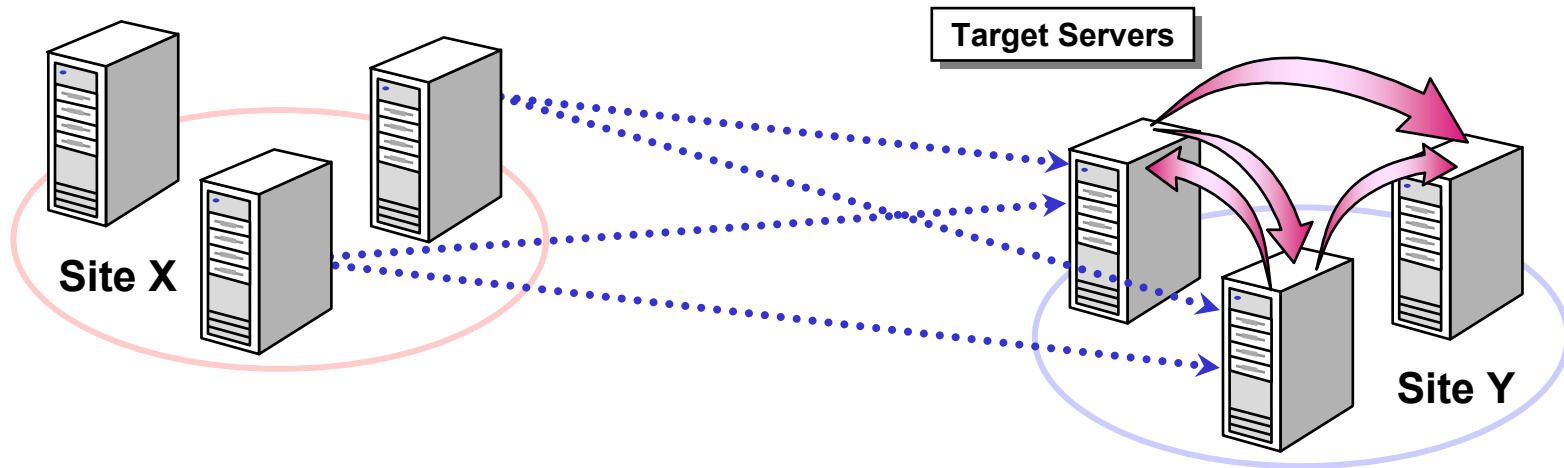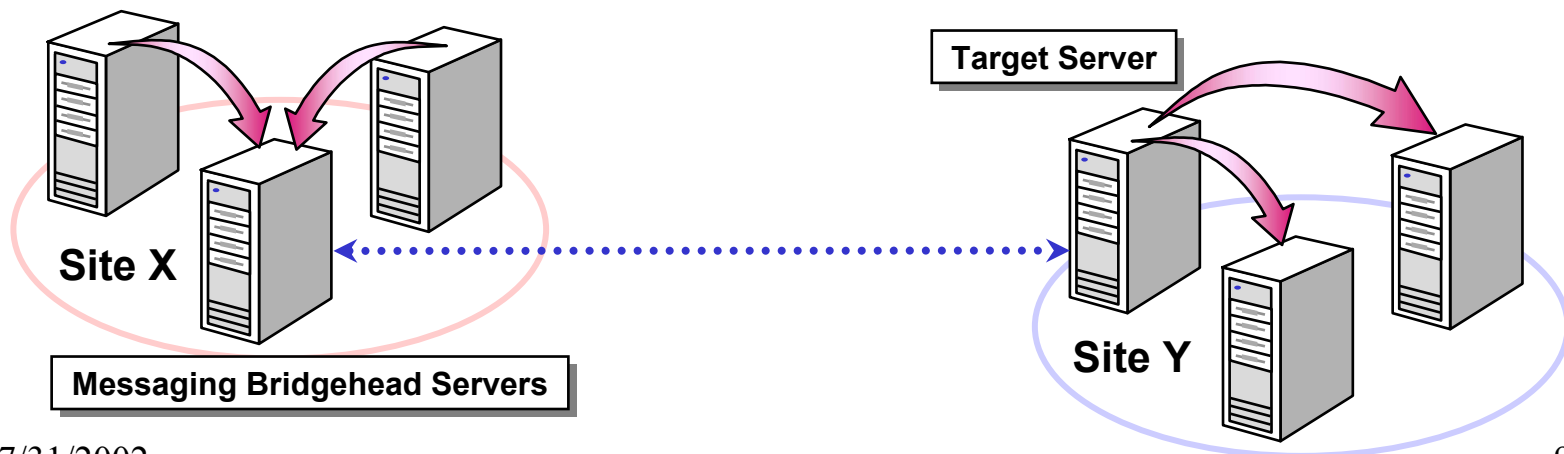
Intrasite Directory Replication

- Adding Servers to a Site

- Maintaining Replication Lists

- Function of the KCC

- Directory Management

Knowledge Consistency Checker

- **KCC Responsibilities**
  - **Checks other servers within the site for all known servers**
  - **Adds any *new* servers to the REPS-TO/REPS FROM lists**
- **KCC Activation**

Other Servers?

A

B

C

REPS-FROM

REPS-TO
Server B
Server C
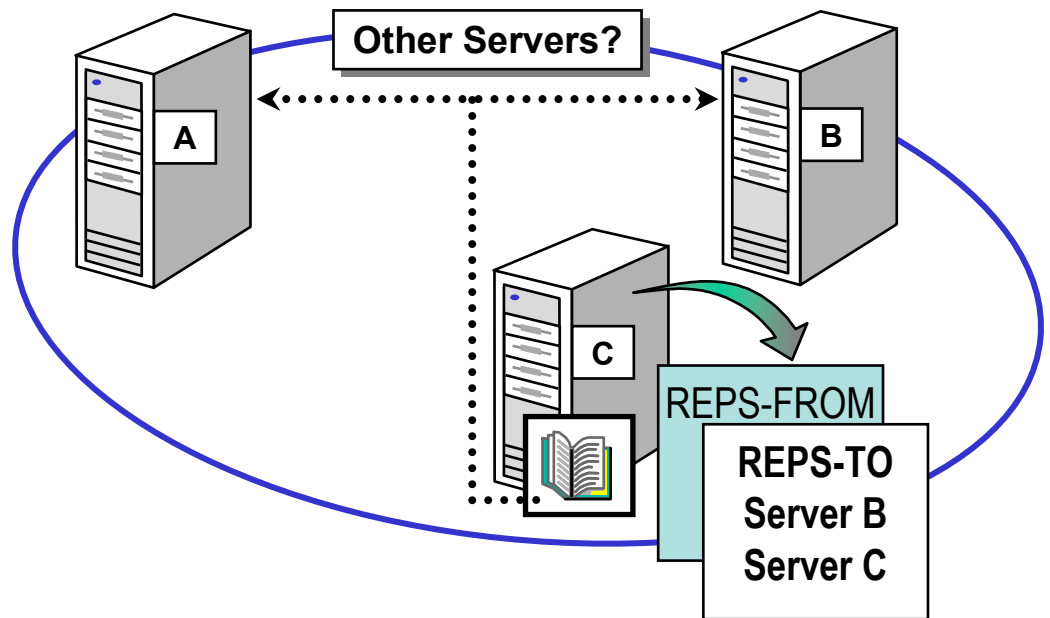
Directory Management

- Maintaining Update Sequence Numbers (USNs)

  – USNs track updates in the directory between servers.

- Resolving USN Differences

  – When the USN is different, the local Directory Service requests all objects greater than those recorded locally.

Multisite Server Communication

- Introduction to Connectors

- Address Space

- Replication of Address Space

- Assigning Connector Costs

- Load Balancing

- Cost and Routing

Multisite Server Communication

System
Attendant

Directory
Service

Information
Store

MTA

EDK
Connector

Microsoft Mail
Connector

Dirsync

System
Attendant

Directory
Service

Information
Store

MTA

EDK
Connector

Dirsync

Microsoft Mail
Connector
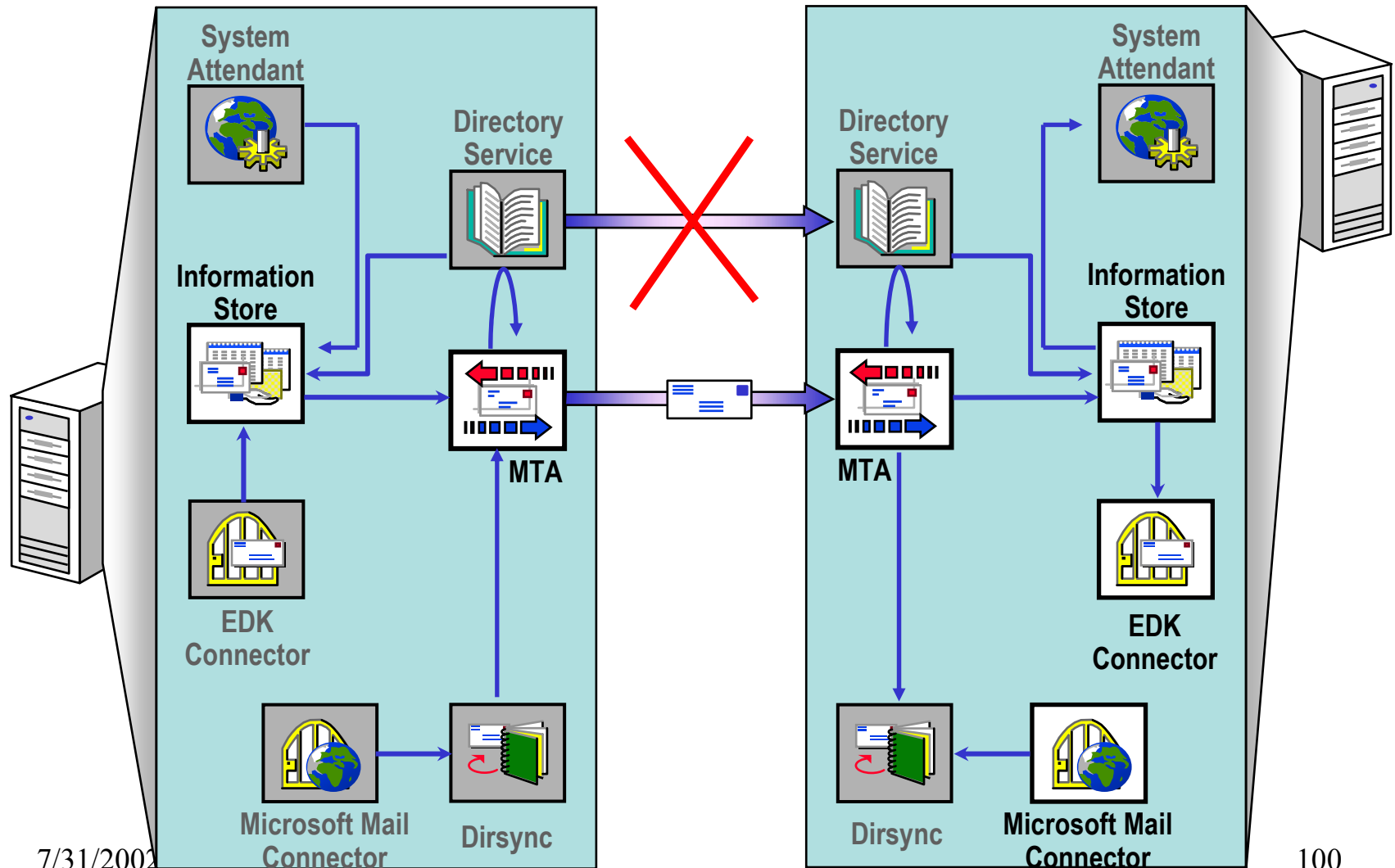
Connectors

- Messaging Connectors
  - Site Connector
  - X.400 Connector
  - Dynamic RAS Connector
  - Internet Mail Service
- Directory Replication Connector
- Routing

Address Space

- Set of address information associated with a connector identifying routes to recipients.

- Defines the connector over which a certain type of message can be transmitted.

- Each user has a native address to each type of connector.

Replication of Address Space

- Preventing Address Space Replication
- Controlling the Scope of Replication (the administrator-defined boundary)
  - Organization
  - Site
  - Location

X.400

- Developed by the International Telecommunications Union (ITU)
  - Based on OSI reference model and ISO protocols
  - Follows 1984 "Red Book" standards
  - Follows 1988 "Blue Book" standards providing support for MIME and Attachments
- Series of Recommendations for Message Handling
- Designed to:
  - Enable global messaging
  - Be hardware independent
  - Be software independent
- Can be used to connect exchange sites
- Second most efficient connector

X.500 Concepts

- X.500 Directory Recommendation
  - Exchange uses a directory model based on X.500 Directory Recommendation
- X.500 Features
  - Powerful search capabilities
  - Single global, homogeneous namespace
  - Structured information framework
  - Standards-based directory services
- X.500 Limitations
  - A Decline is search speed
  - Limited amount of information can be returned

X.400 Common Components

- Typical X.400 Messaging System includes:
  – User Agents (UA) that act on behalf of the user
  – MTAs that move messages between users and exchange messages with other MTAs
  – Message Transfer System (MTS) sends out and receives messages from UAs and MTAs
  – Directory User Agents (DUAs) access the directory
  – Directory System Agents (DSAs) provide access to the directory information base for DUAs and other DSAs
- Additional Components include:
  – Distribution Lists
  – Access Units

X.400 Message Handling

Message Handling System (MHS)

Message Store

Message Transfer Agent

X.400

MHS

MHS

MHS

Directory User Agent

Directory System Agent

X.500

User Agents
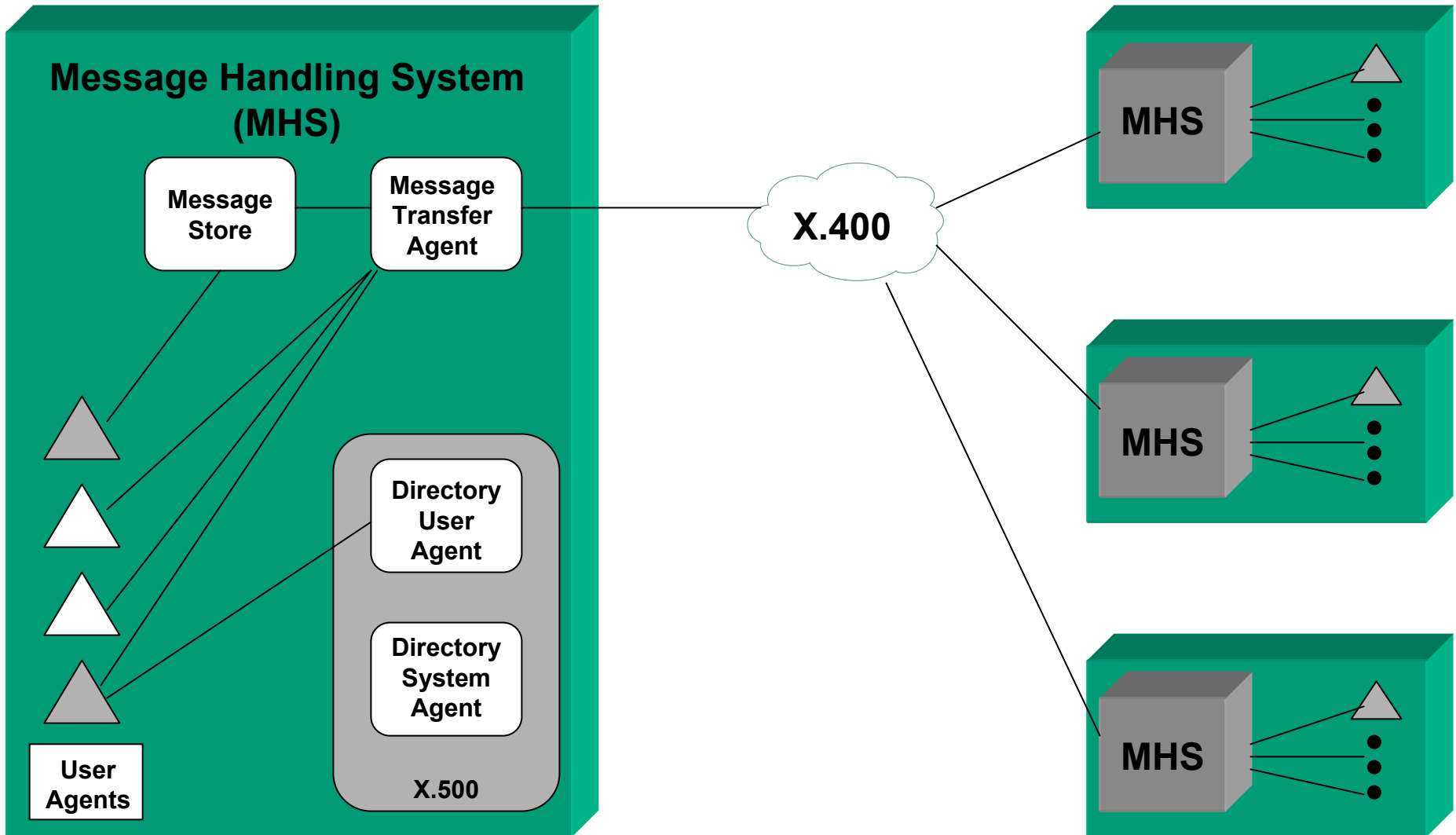
MTA Transport Stack

- **Allows Configuration for Exchange Server**

- **Requires Prior Installation**

- **One Transport Must Be Installed:**
  - **TCP/IP**
  - **TP4**
  - **X.25**

Configuring X.400

- **Configure the X.400 Connector After the MTA Transport Is Configured**

- **X.400 Connector Tabs**
  - **General**
  - **Schedule**
  - **Stack**
  - **Override**
  - **Connected Sites**
  - **Address Space**
  - **Delivery Restrictions**
  - **Advanced**

Directory Replication

Directory Replication Connector

Site X

Site Y

Any Messaging Connector
- **Site**
- **X.400**
- **Dynamic RAS**
- **Internet Mail Service**
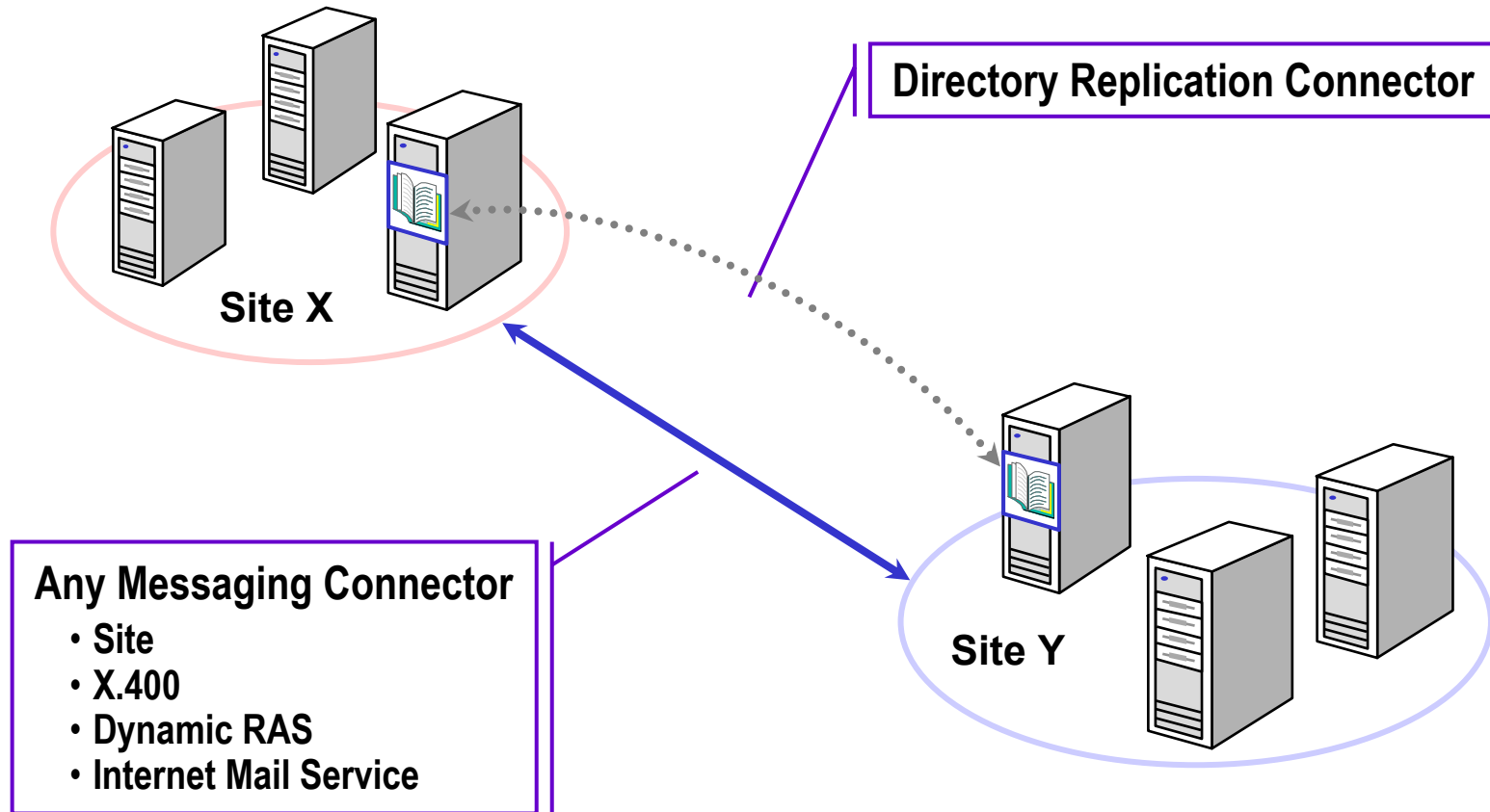
Directory Replication - Transitive

Site X

Site Y

Site Z
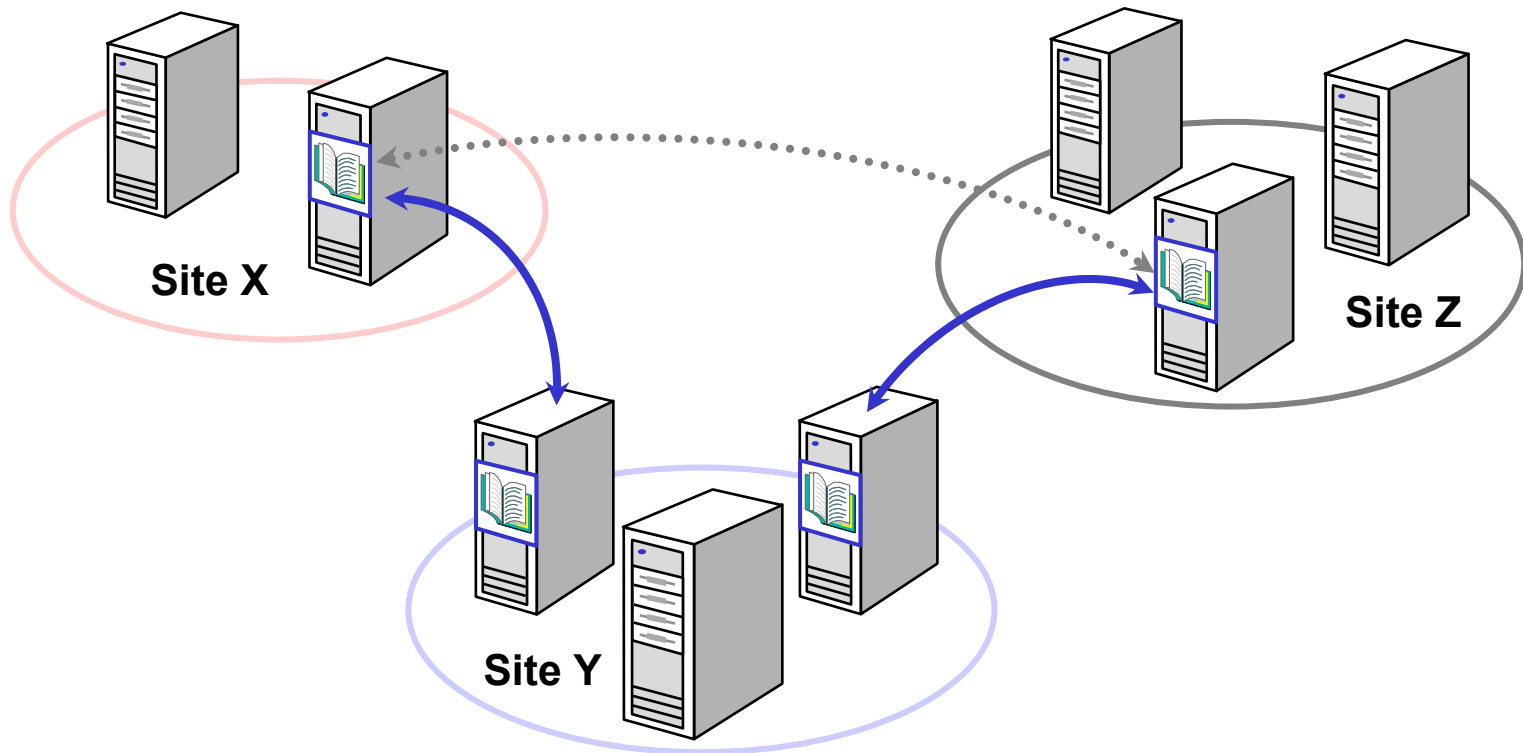
Site to Site Replication

Site X

Site Y
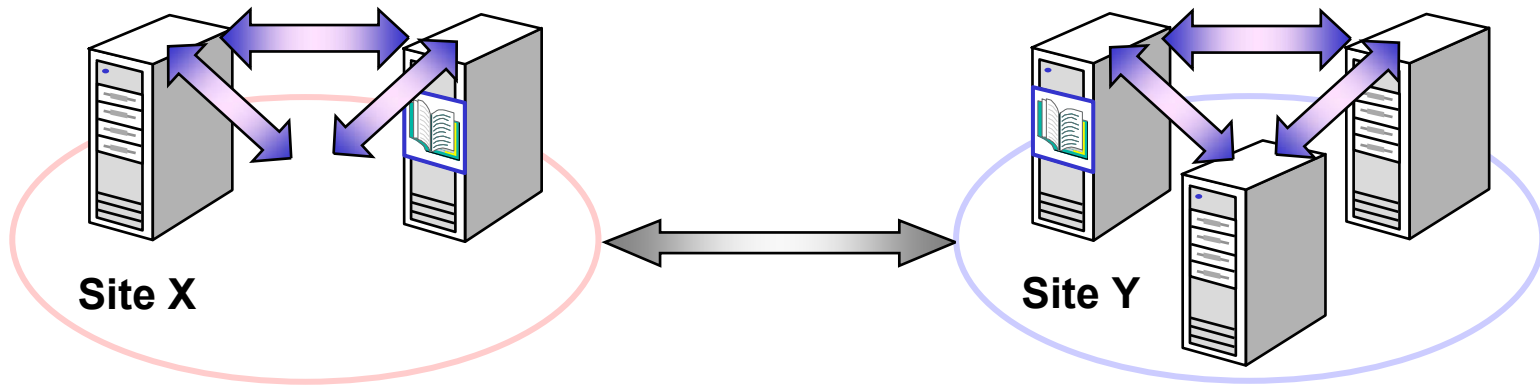
Manage Directory Replication between Sites by:

- **Synchronizing Directory Information Within a Site**
- **Replicating Basic Information Between Sites**
- **Checking Knowledge Consistency Between Sites**
- **Replicating the Remaining Data Between Sites**

Microsoft Exchange Lab #2

Connectors

45 Minutes

Exchange Internet Integration

HTTP

LDAP

Internet

Directory Service

Internet Mail Service

SMTP NNTP

USENET Host

Information Store

Internet News Service

Exchange Server

IIS & Outlook Web Access

IMAP4 POP3 SMTP
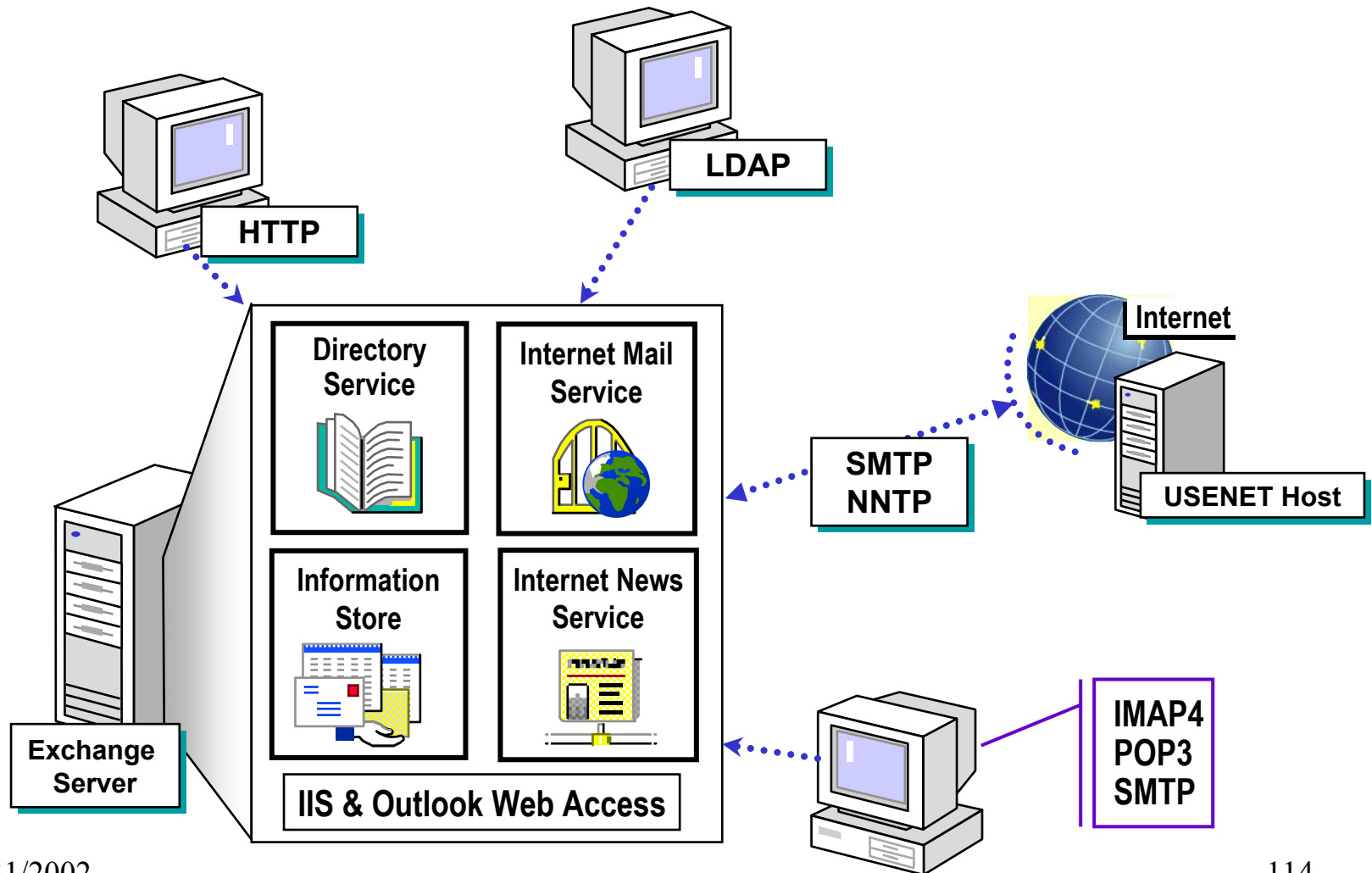
Internet Mail Service

MSTP

- **Converts exchange email to SMTP format**

- **Can be used to connect exchange sites**

- **Provides access for new internet-related features**

MSTP

SMTP or Internet

SMTP Host

Exchange Server

Exchange Server

IMS Process

Directory Service

MTA

Exchange Server

Clients

Information Store

Internet Mail Service

SMTP or Internet

1
2
3
4
5
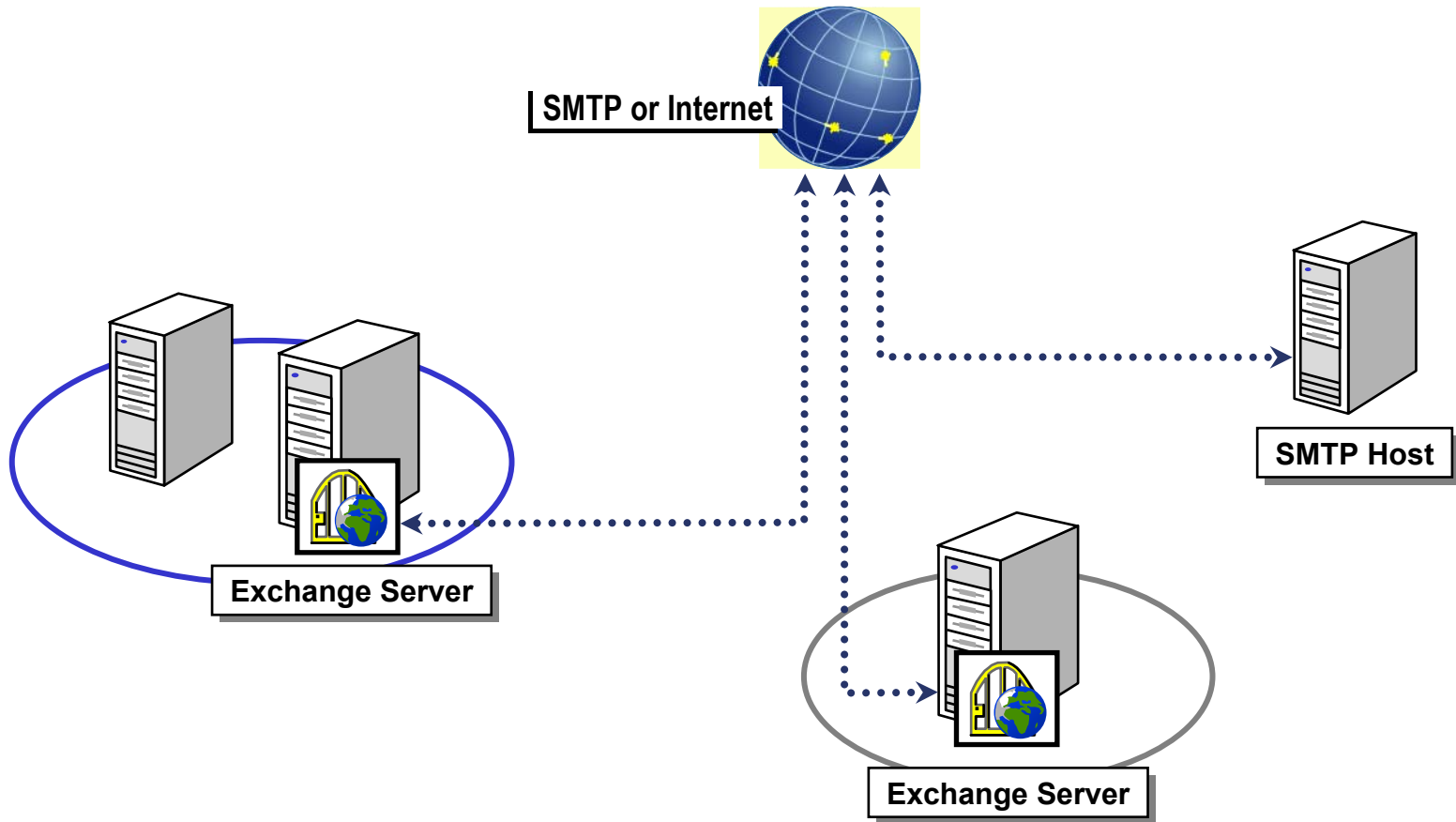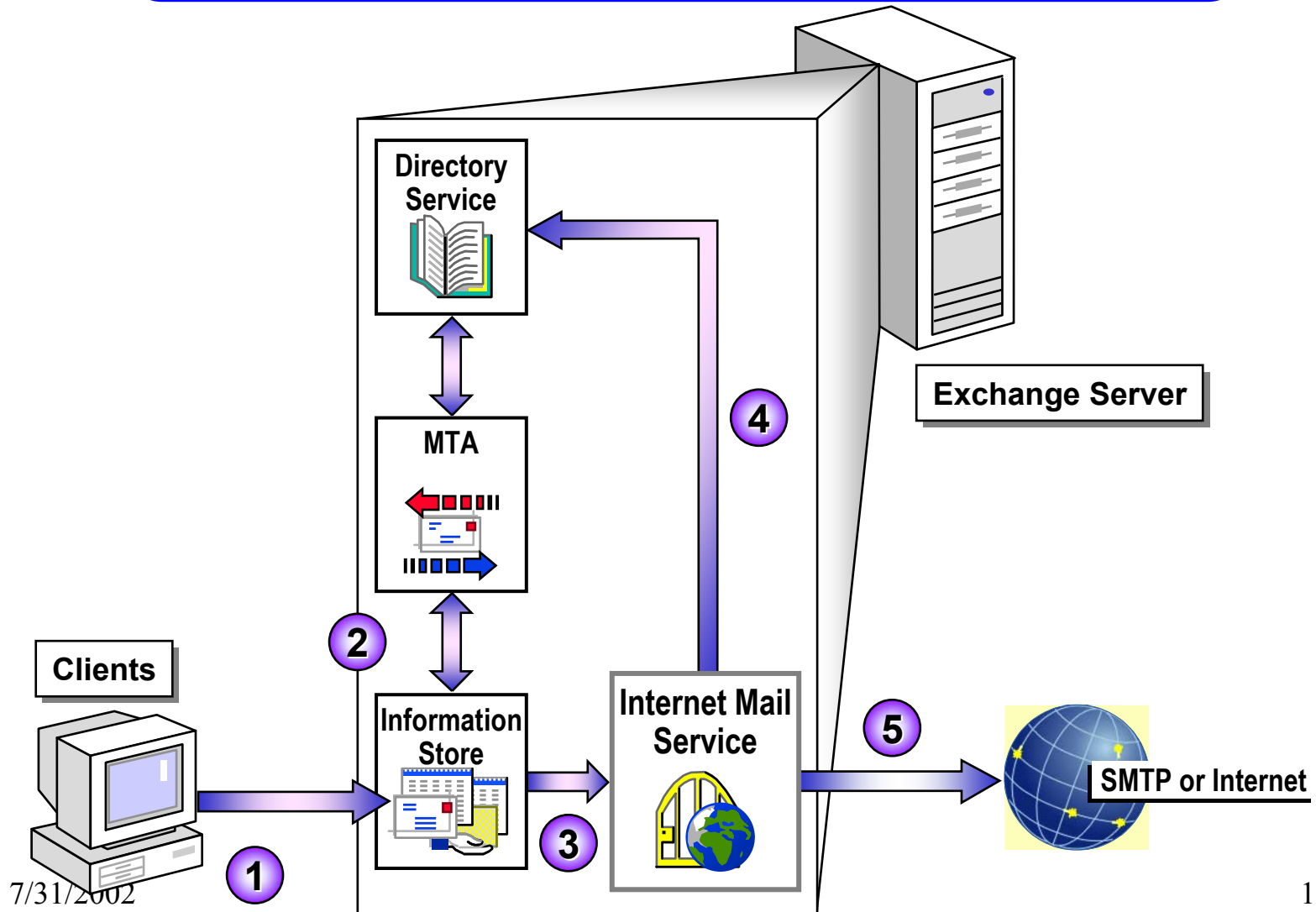
IMS Setup

- **Install and Configure TCP/IP**
- **Install RAS and Create a Phone Book Entry for Your ISP**
- **Install the Internet Mail Service**
- **Customize Internet Mail Service Properties**
- **Add the Internet Mail Service Computer to the DNS Server**
- **Stop and Restart the Internet Mail Service**
- **Test Internet Mail Service Connections**

Microsoft Exchange
Lab #3

Internet Mail Service

25 Minutes

MSTP

- MTA determines route using the Gateway Address Routing Table (GWART)

GWART

```
x=</O=Microsoft/
/O=Microsoft/OU
c=<US>
  a=< >
    p=<Microsoft>
```
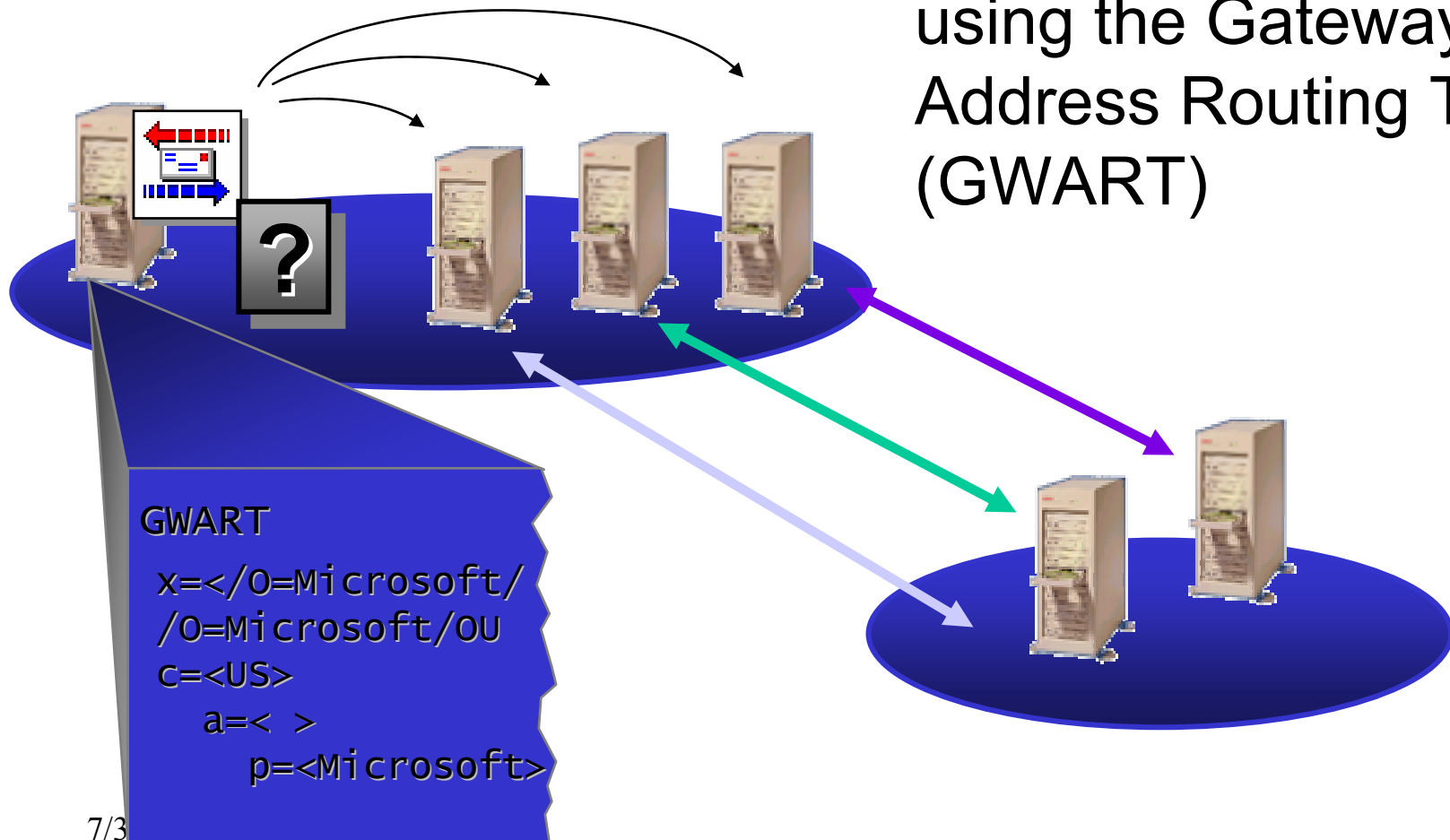
Assigning Costs

- Cost values control message traffic by priority level

- Cost values range from 1-100

Dynamic RAS connector over a RAS link

100

50

X.400 Connector over a satellite link

Site X

Site Y

1

Site connector over a T1 link

Cost and Routing

Cost=1

Site X

Site Y

Cost=5

Cost=3

Site Z
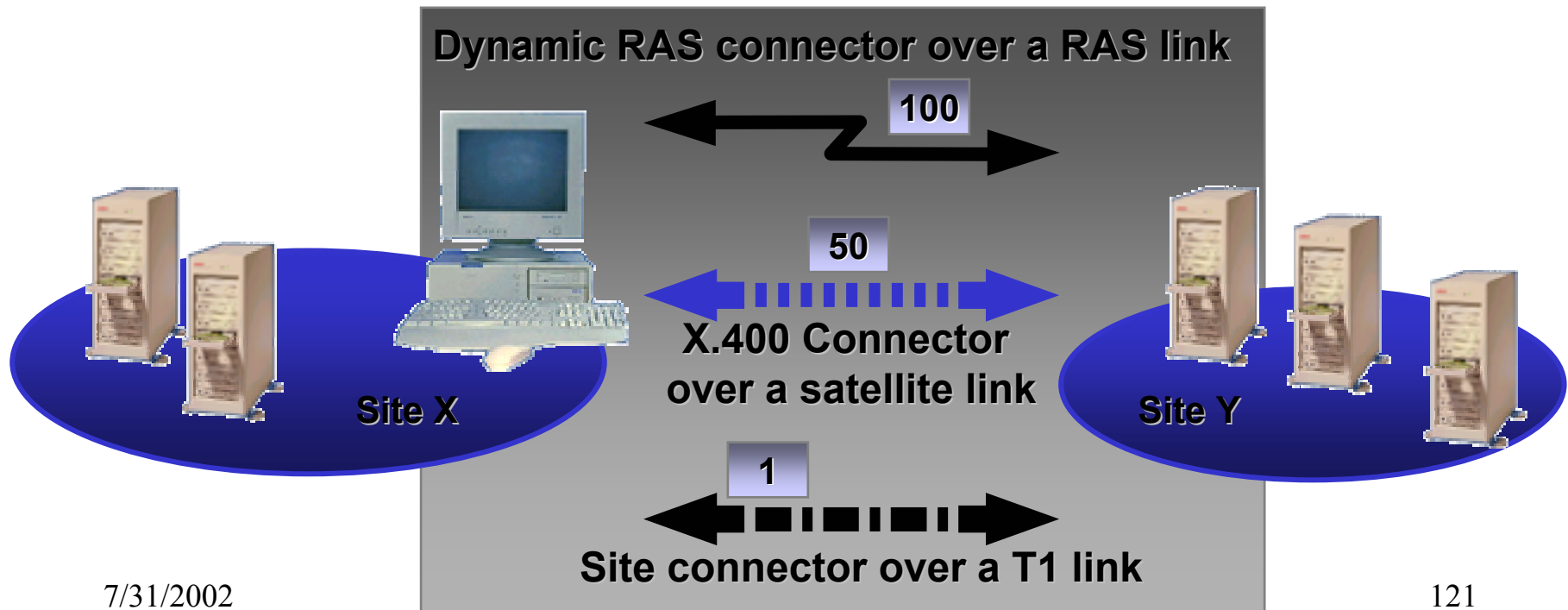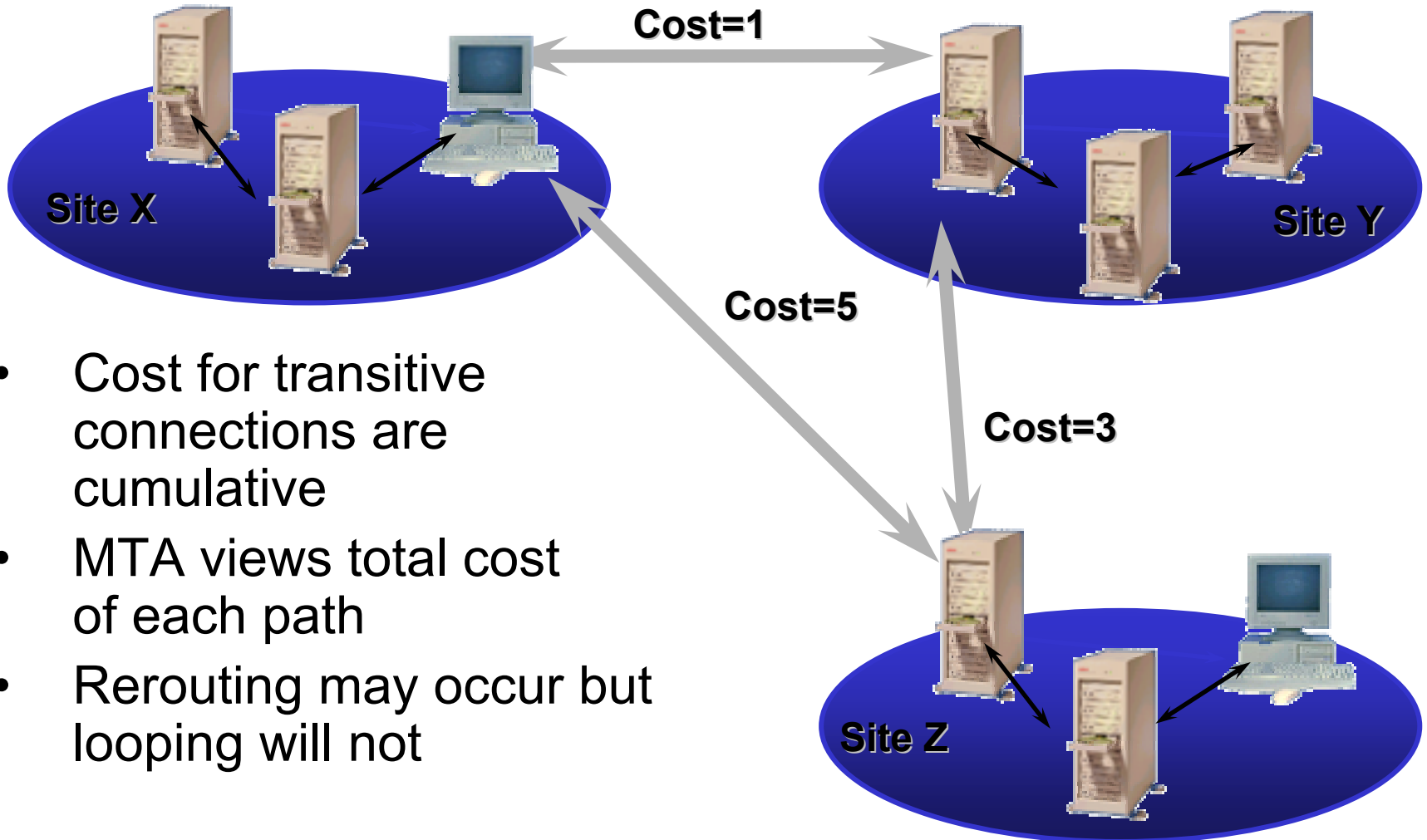
- Cost for transitive connections are cumulative
- MTA views total cost of each path
- Rerouting may occur but looping will not

Cost and Load Balancing

Site X

X.400 connector over a X.25 network

50

50

Site connector over a fiber link (TCP/IP)

Site Y
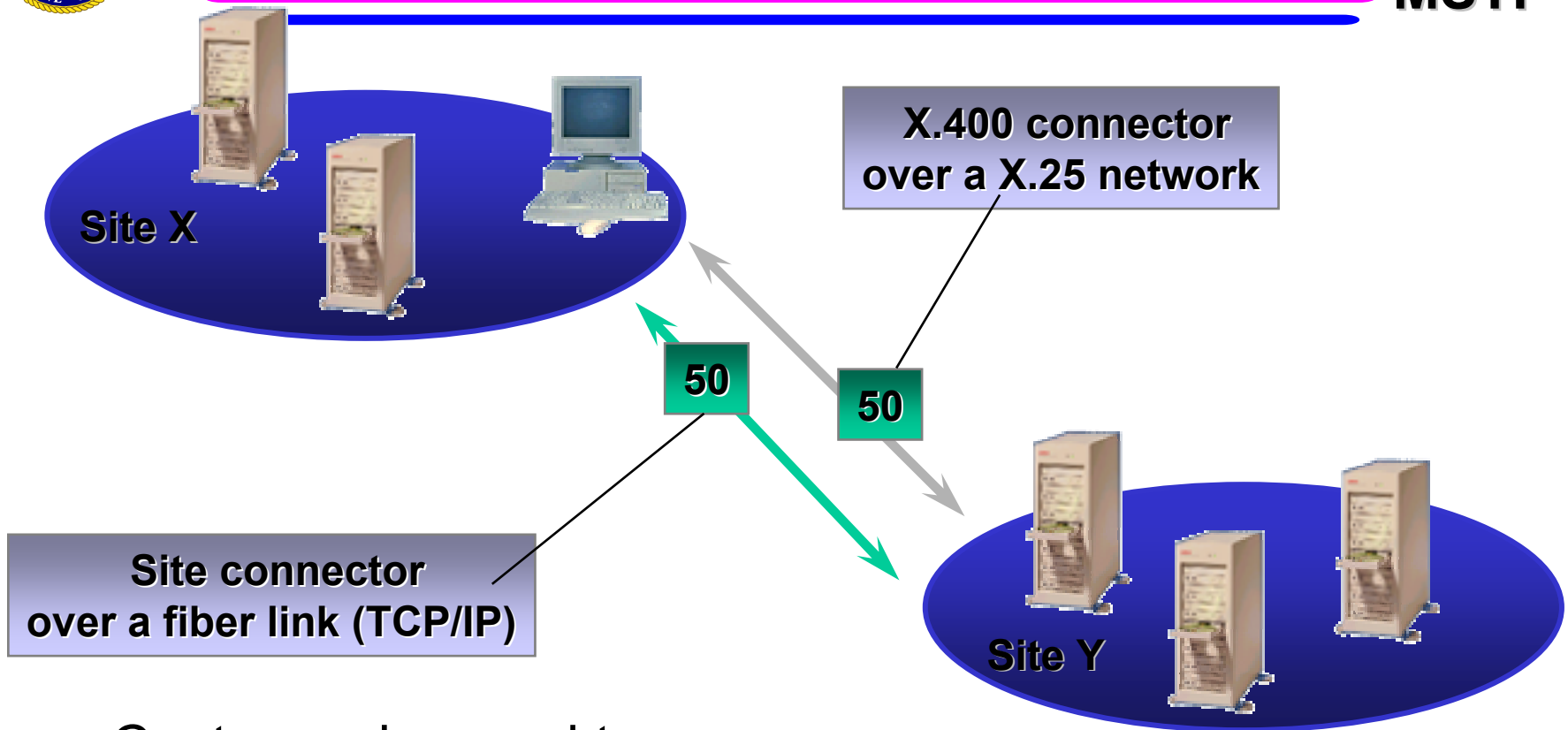
- Costs can be used to balance load between connectors
  - NB If route costs are the same

Microsoft Exchange
Lab #4

Connecting to the MITNOC

40 Minutes

Management and Sustainment

- Maintaining an Exchange Server Organization

- Microsoft Exchange Server Monitors

- Microsoft Exchange Link Monitors

- Microsoft Exchange Backup and Recovery

- Best Practices for Microsoft Exchange

Introduction to Server Monitors

- Function of Server Monitors
  - Check status of Windows NT services

- Server Monitor Configuration
  - Polling intervals
  - Escalation notification
  - Escalation actions
  - Clock synchronization

Server Monitor

A

B

C

Server Monitor Properties

My Server Monitor Properties   ✕

| General | Permissions | Notification | Servers | Actions | Clock |

My Server Monitor

Monitor configuration

Directory name:

My Server Monitor

Display name:

My Server Monitor

Log file:

C:\mylogs\srvmon.log   Browse...

Polling interval

Normal   15   Minutes ▼   The critical sites polling interval is used
                                        after an error or warning condition has
Critical sites   5   Minutes ▼   been detected. Otherwise, the normal
                                        polling interval is used.

OK   Cancel   Apply   Help

Server Monitor Notification

My Server Monitor Properties ☒

| General | Permissions | Notification | Servers | Actions | Clock |

My Server Monitor

When	How	Who
🔻 15 Minu…	Mail Message	Administrator
🔻 15 Minu…	Windows NT Alert	HELPDESK
🔻 15 Minu…	Launch a Process	D:\MYAPPS\MYPAGER.EXE

[New...]   [Edit...]   [Remove]

A notification is sent when a monitored server enters an alert or warning state. When adding a notification, you should test it to ensure that it is configured properly.

[OK]   [Cancel]   [Apply]   [Help]

Server Monitor Servers

My Server Monitor Properties ✕

| General | Notification | Servers | Actions | Clock |

My Server Monitor

Servers:

```
[ ] MSTP02E
[ ] CAI01E
```

Add ->

<- Remove

Monitored servers:

```
[ ] MQGCAI02
```

Site:
MSTP ▼

Services...

| OK | Cancel | Apply | Help |

Server Monitor Actions

My Server Monitor Properties   ☒

| General | Permissions | Notification | Servers | Actions | Clock |

My Server Monitor

Action when a service is stopped

First attempt: | Take no action ▼ |

Second attempt: | Restart the service ▼ |

Subsequent attempts: | Restart the computer ▼ |

Restart delay (seconds): | 60 |

Restart message:

This Server is restarting as a result of an Exchange Server
Monitor. For more information, please contact HelpDesk at
x12345

| OK | Cancel | Apply | Help |

Server Monitor Clock Synchronization

My Server Monitor Properties   ✕

| General | Permissions | Notification | Servers | Actions | Clock |

My Server Monitor

Clock monitoring configuration

Warning if off by more than: [15]   sec   ☑ Synchronize

Alert if off by more than: [60]   sec   ☑ Synchronize

Enter the allowable time differences between the computer
where the monitor is running and the server being monitored. If
the differences are exceeded, the monitored server will enter
either a warning or an alert state. Optionally, the monitored
server's clock can be synchronized.

| OK | Cancel | Apply | Help |

Link Monitors

Link Monitor

- Function of Link Monitors
  - Send messages to verify connectivity
- Link Monitor Configuration
  - Polling intervals
  - Escalation notification
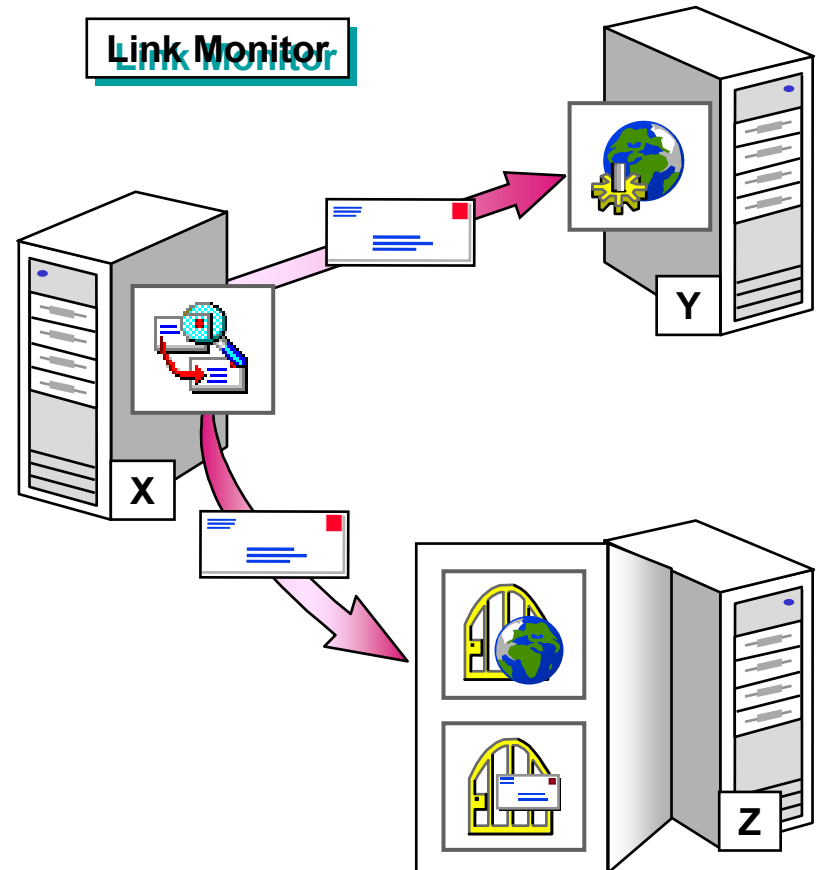
Link Monitor Properties

My Link Monitor Properties   ☒

| General | Permissions | Notification | Servers | Recipients | Bounce |

My Link Monitor

Monitor configuration

Directory name:

My Link Monitor

Display name:

My Link Monitor

Log file:

C:\mylogs\linkmon.log   Browse...

Polling interval

Normal   15   Minutes ▼

Critical sites   5   Minutes ▼

The critical sites polling interval is used after an error or warning condition has been detected. Otherwise, the normal polling interval is used.

OK   Cancel   Apply   Help

Link Monitor Notification

My Link Monitor Properties ✕

| General | Notification | Servers | Recipients | Bounce |

My Link Monitor

When	How	Who

New...   Edit...   Remove

A notification is sent when a monitored server enters an alert or warning state. When adding a notification, you should test it to ensure that it is configured properly.

OK   Cancel   Apply   Help

Link Monitor Servers

My Link Monitor Properties ✕

| General | Permissions | Notification | Servers | Recipients | Bounce |

My Link Monitor

Servers

Monitored servers:

MSTP02E

Add ->

<- Remove

Site:

MSTP ▼

OK   Cancel   Apply   Help

Link Monitor Recipients

My Link Monitor Properties ☒
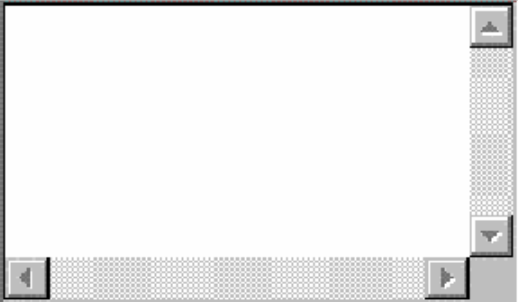
| General | Permissions | Notification | Servers | Recipients | Bounce |

My Link Monitor

Message subject returned from
- ⊙ None
- ○ List

Modify...

Message subject or body returned from
- ⊙ None
- ○ List

Modify...

Typically, you should use the left list. However, if you don't expect the full subject of the bounced message to be preserved, as in non-delivery reports, use the list on the right.

OK   Cancel   Apply   Help

Link Monitor Bounce Properties

Link Monitor Properties ☒

| General | Notification | Servers | Recipients | Bounce |

Link Monitor

Bounce message return time

Enter warning state after: `30`   Minutes ▼

Enter alert stage after: `60`   Minutes ▼

This server will enter a warning or alert state after the time you specify.

[OK]   [Cancel]   [Apply]   [Help]

Post-Configuration Issues

- Starting and Stopping Monitors

- Obtaining Details on Server Monitors

- Obtaining Details on Link Monitors

- Running Multiple Monitors and Performing Maintenance

Starting and Stopping Monitors

- Starting Monitors Manually
  - Controls monitoring for specific computers
- Starting Monitors with the Administrator Program
  - Monitors start up with the Administrator program
- Automatically Starting Monitors at System Boot
  or Log On
  - Use SRVANY.EXE from Windows NT Resource Kit
  - Uses Windows NT AutoAdminLogon Feature
  - AutoAdminLogon Can create a security risk

Details on Server Monitors

MSTP

MSTP Exchange Server Monitor Properties

General | Notification | Servers | Actions | Clock

MSTP Exchange Server Monitor

Monitor configuration

Directory name:

MSTP Exchange Server Monitor

Display name:

MSTP Exchange Server Monitor

Log file:

\\Mstpfs\MSTP Users\Government\C2SB\Technical Section\Server Lc   Browse...

Polling interval

Normal   15   Minutes

Critical sites   5   Minutes

The critical sites polling interval is used after an error or warning condition has been detected. Otherwise, the normal polling interval is used.

OK   Cancel   Apply   Help

Details on Server Monitors

Details on Server Monitors

Details on Server Monitors

MSTP

MSTP Exchange Server Monitor Properties

General | Notification | Servers | Actions | Clock

MSTP Exchange Server Monitor

Action when a service is stopped

First attempt: Restart the service

Second attempt: Restart the service

Subsequent attempts: Restart the service

Restart delay (seconds): 1500

Restart message:

OK | Cancel | Apply | Help

Details on Server Monitors

MSTP Exchange Server Monitor Properties

General | Notification | Servers | Actions | Clock

MSTP Exchange Server Monitor

Clock monitoring configuration

Warning if off by more than: 15 sec ☑ Synchronize

Alert if off by more than: 60 sec ☑ Synchronize

Enter the allowable time differences between the computer where the monitor is running and the server being monitored. If the differences are exceeded, the monitored server will enter either a warning or an alert state. Optionally, the monitored server's clock can be synchronized.

OK | Cancel | Apply | Help

NT Performance Monitor

- Important Windows NT Counters

- Important Exchange Server Counters

- Exchange Server Performance Charts

Important NT Counters

- LogicalDisk—%Disk Time

- Memory—Pages/sec

- Processor—%Processor Time

- Process—Elapsed Time

- Redirector—Bytes Total/sec

- Redirector—Network Errors/sec

Exchange Server Counters

Performance Monitor

File   Edit   View   Options   Help

Color	Scale	Counter	Instance	Parent	Object	Computer
	1.000	% Total Processor Ti	• • •	• • •	System	\\WASHINGT
	1.000	% Processor Time	dsamain	• • •	Process	\\WASHINGT
	1.000	% Processor Time	emsmta	• • •	Process	\\WASHINGT
	1.000	% Processor Time	store	• • •	Process	\\WASHINGT
	1.000	% Processor Time	mad	• • •	Process	\\WASHINGT
	1.000	Pages/sec	—	• • •	Memory	\\WASHINGT

Last   0.000   Average   0.874   Min   0.000   Max   16.975   Graph Time

Data: Current Activity
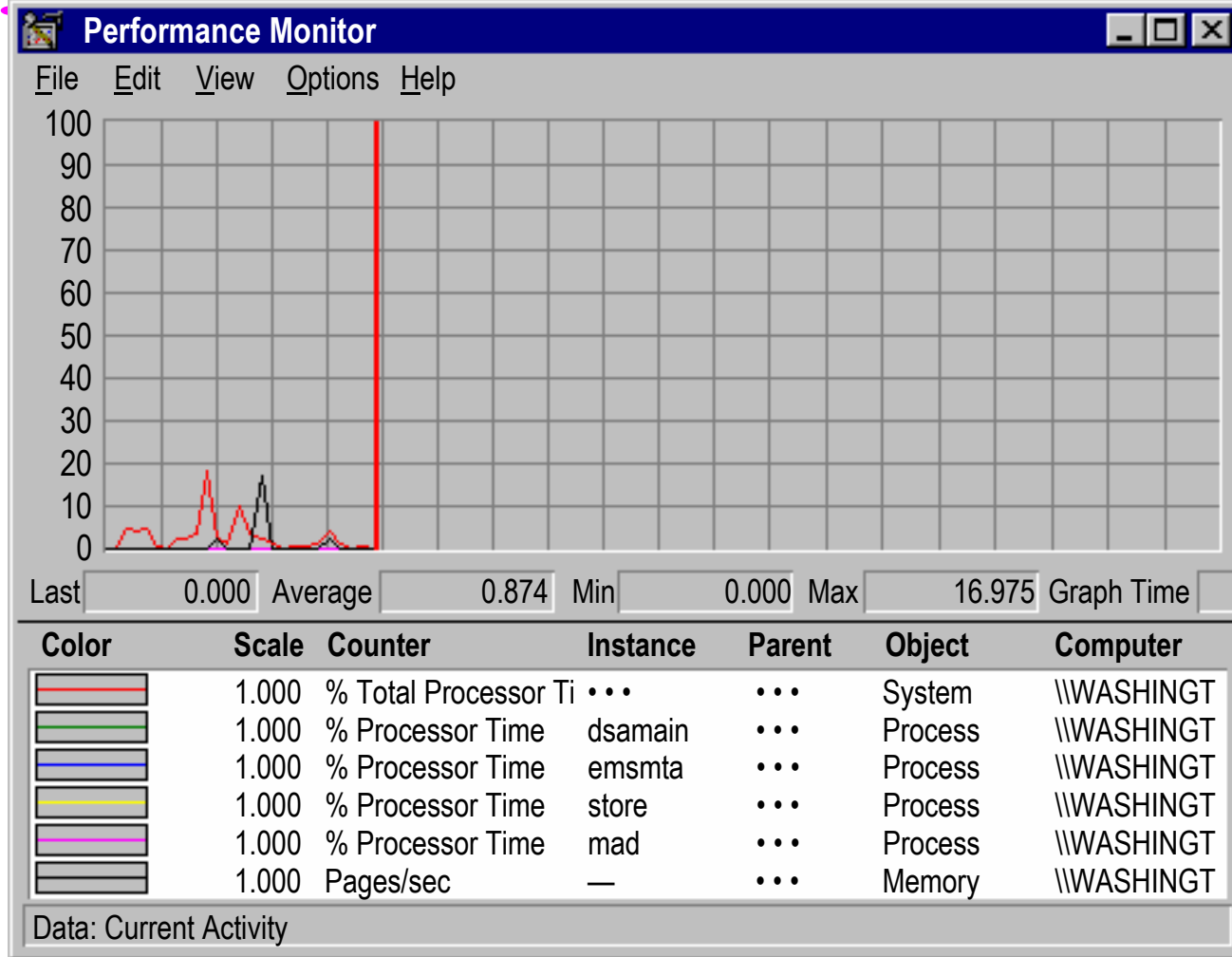
Exchange Server Performance

Performance Charts Track Frequent Activity on the Server, Such as:

- Server Health
- Server History
- IMS Queues
- IMS Statistics

- IMS Traffic
- Server Load
- Server Queues
- Server Users

Microsoft Exchange Lab #5

Monitoring Microsoft Exchange Server

40 Minutes

What will the impact be if disaster strikes today?

The Challenge

- Microsoft Exchange is a business-critical application

- Users expect 7x24 service

- More users per server

    – Higher risk per server

    – Larger databases

- Many companies have inadequate disaster recovery capability

- Must understand Windows NT® recovery as well as Exchange architecture

The Challenge - DR Variables

S.H.O.E.

Software	Hardware	Operator	Environment
OS	Servers	PEBKAC	Power
Device Drivers	Routers	Human Error	Fire
Name Resolution	Hard Disks	Sabotage	Flood
Authentication	Memory	Mailstorms	Earthquake
Virus	Remote Access	Planning	Heat
System Limits	Network	Monitoring	Dust
Application Code	Backup Devices	HW Placement	Tornado

Ontrack Data International Inc. Common Causes For System Failure:

32% Human Error!

Exchange 5.5

- <u>Larger Stores - limited by hardware</u>

  – Business Impact: # users per server becomes issue of practicality

  – System Impact: log drive size, large servers, backup speed

- <u>Deleted Item Retention</u>

  – Business Impact: solves key issue of restoring single user data

  – System Impact: utilizes more room in the store for non-purged items

Exchange 5.5

- <u>Store Performance</u>
  - Limited by speed of tape drive
  - Tape devices available - 25-30 GB/hr
  - Improved online maintenance
    - 5.5 SP1 logs amount of free space in DB per night
- <u>Tools</u>
  - ESEUTIL - in place repair - DB + 10/25% space needed
  - Perfmon counters moved under Database Object; more detailed
  - MS Cluster Server Support

Exchange Recovery Concepts

Location Of Microsoft Exchange Data

MSTP

- Directory service & Information store
  - \\exchsrvr\dsadata; \\exchsrvr\mdbdata
- Key management server
  - SECURITY directory
    (Microsoft Exchange 4.0 and 5.0)
  - EXCHSRVR\KMSDATA
    (Microsoft Exchange 5.5)
  - KM Server startup disk
- Windows NT® Registry
- Other files/directories

Message Flow

MSTP

Exchange client sends message

Exchange Server

Memory

Fast Sequential Storage

1. Transaction log (immediate)

2. Information store (delayed)
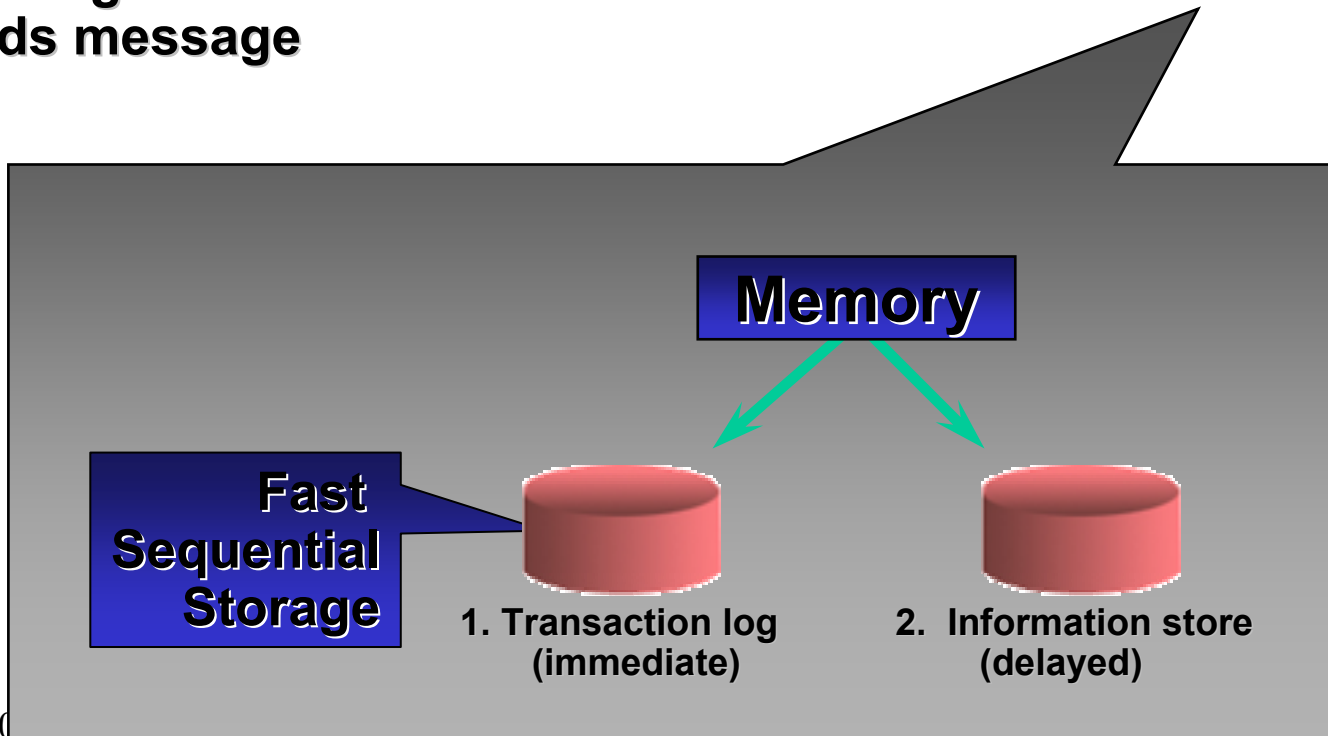
Transaction Log Benefits

- Performance
  - Logs are written sequentially and appended to the end of the file. EDB files require random access writing to the disk

  - For best performance, store logs on dedicated physical disk

- Recoverability
  - If EDB drive fails, a backup can be restored and logs played back to the minute of failure

Transaction Log Files

- The current transaction log is always EDB.LOG

- When a log file is filled, it's renamed and a new log is created and named EDB.LOG

- Renamed logs are sequentially numbered (EDB00001.LOG, EDB00002.LOG……)

- Log files are always 5.2MB

MSTP

- Have a signature

- Must match the signature of the corresponding .EDB file

- If signatures do not match, the services will not start

  – Error -530 or -531 generated

- Path to the database is hard-coded in the log file

- Databases do not know where their log files are

Checkpoint File

- EDB.CHK

- Used for recovery to indicate what entries should be replayed

- Updated each time data has been written
  to a .EDB file

EDB.CHK

Transaction log entries written to database

Transaction log entries not yet written to database

.EDB
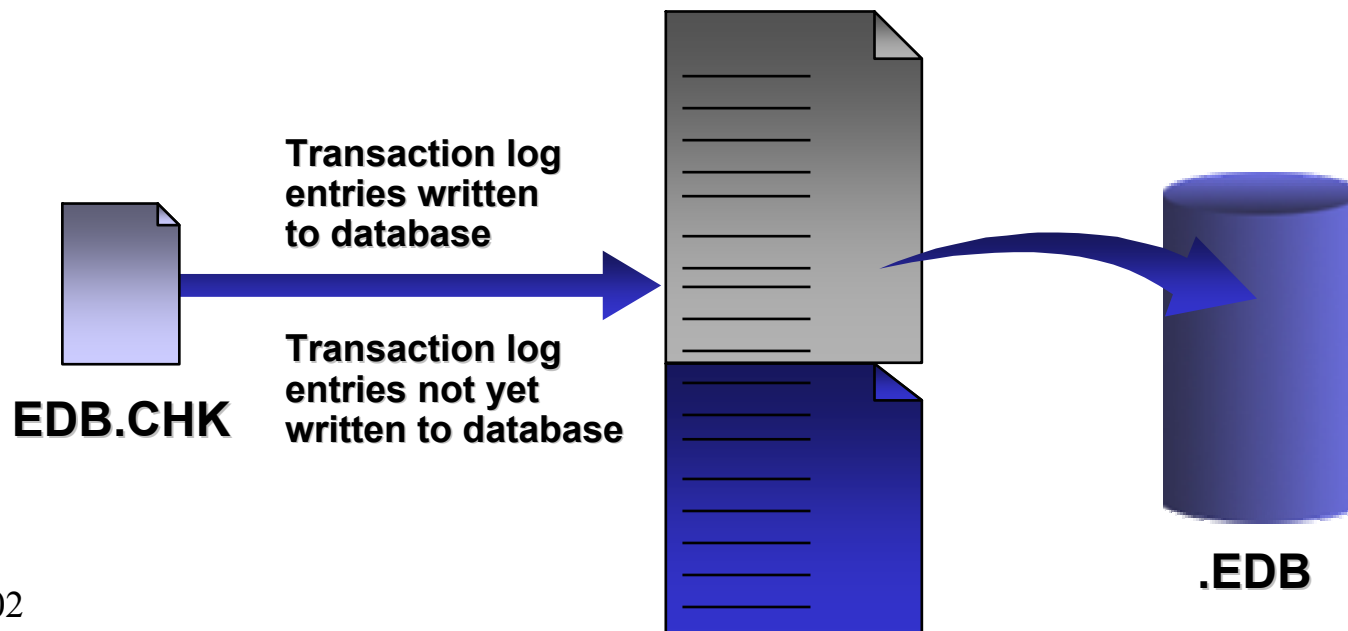
Recovery Using Logs

- Pass the log file path to ESE/EDB
- Look for the log files
- Open the databases in the log files
- Compare log file signatures
- Apply logs to the database(s)
  - Look at checkpoint file for transactions not committed
  - Write uncommitted transactions to database

Circular Logging

- When enabled
  - Prevents the continuous build up of log files by overwriting logs in a circular manner
  - Differential and Incremental backups cannot be performed
  - May prevent "to the point of crash" recoverability
- Enabled by default
- Recommended to turn OFF circular logging

Online Backup

- Backup while the Microsoft Exchange services are running

- Requires an "Microsoft Exchange-aware" backup program

- Backs up
  – Microsoft Exchange directory
  – Microsoft Exchange information store

- NTBACKUP.EXE

- Third-party backup solutions

Offline Backup

- File level backup with services stopped

- Does not automatically play forward through log files upon restore

- Not recommended for daily Microsoft Exchange data backups of IS and DS

- Should be done when online backup fails

- Before applying Service Packs

Comparing Online Backups

Type	Data Backed Up	Logs Purged	Restore
Normal (Full)	**Database and log files**	**Yes**	**. Last Normal** **. Start Service**
Incremental	**Log files only**	**Yes**	**. Last Normal** **. Every Incr** **. Start Service**
Differential	**Log files only**	**No**	**. Last Normal** **. Last Diff** **. Start Service**

***Do not* start the service until all backup sets are restored**

Backup Strategies

Type	Advantages	Disadvantages
Daily Normal	. Simplest Schedule . 1 tape restore	. Max Backup Time . Daily Tape swaps
Sun: Normal Mon-Sat: Incr	. Least backup time . Least perf impact	. Min 2 restores . Multiple tapes
Sun: Normal Mon-Sat: Diff	. Less time than daily normal . Lower perf impact . Multiple copies of logs from Mon-Fri.	. Only 2 restores . Backup time increases daily

Backup Strategies

Sunday Monday Tuesday Wednesday Thursday

- **Daily normal backup**
- **Normal with incremental**
- **Normal with differential**
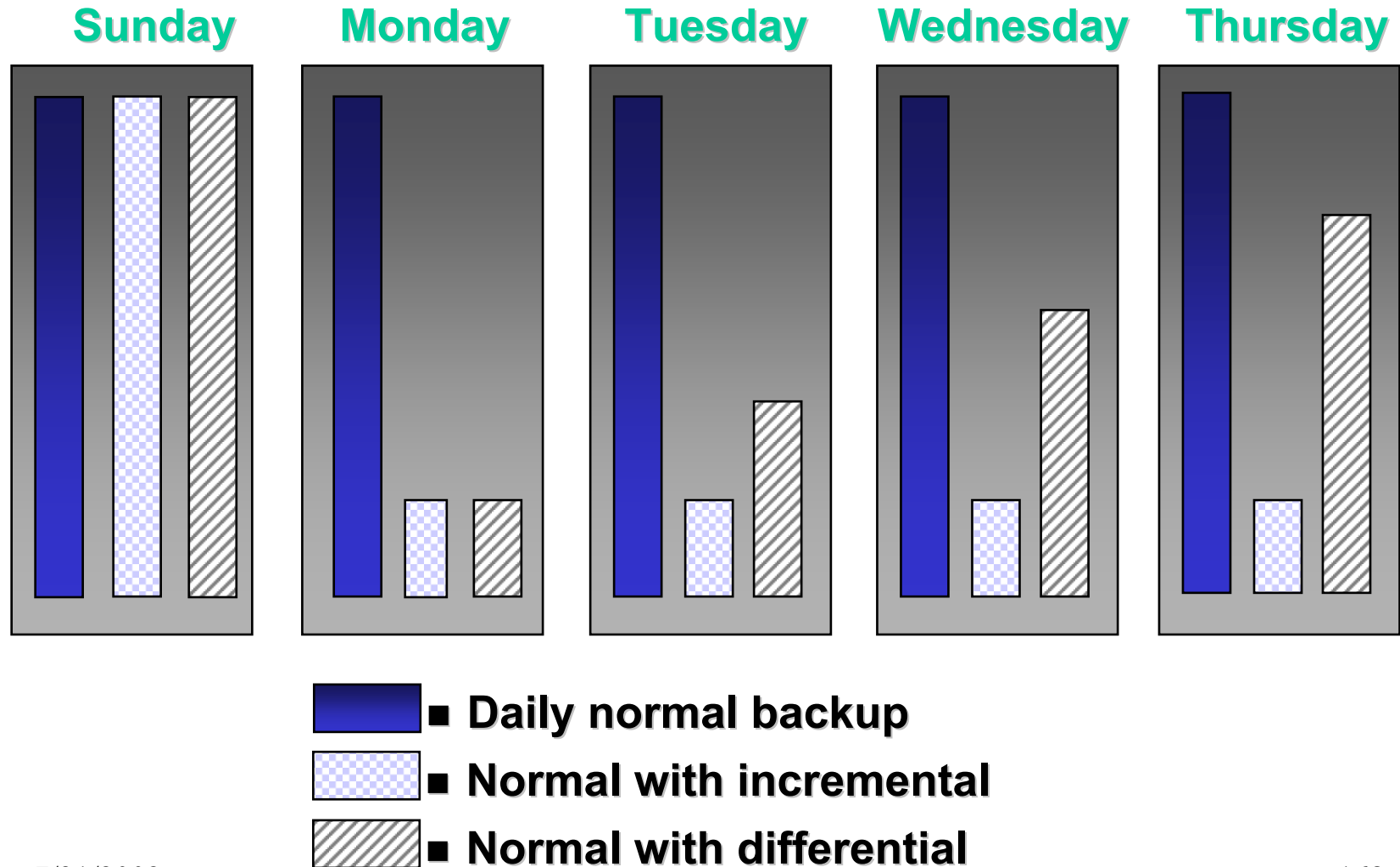
Restoring Data Common issues

- Playing forward through logs after an offline restore

    – Not Automatic for offline restore

    – Online restore always recommended because log playback is automatic

- Logs deleted after restoring an older online backup

    – Always backup existing logs before restoring any data

        • Some logs haven't been backed up

    – "Restore in progress" registry key

        • Tells Store that recovery is in progress

Recovery Scenarios

- Single User / Items

- Full Server

- System Disk Fails

- Database Drive Fails

- Log Drive Fails

- Database Corruption

- Total Building Catastrophe

Case: Single User / Items

- Exchange 5.5 - Use Outlook 8.03 or above to recover single items
  - Use when item retention window still valid for needed retrieval data

- Full store restore to spare machine
  - Use for Exchange 4.0, 5.0
  - Use when you need all mailbox data

- Third party brick backup solution
  - Provides automation
  - Alternative to full store restore

Global Private IS Setting - Item Retention

Single Item Recovery Microsoft Exchange 4.0 and 5.0

- Problem:
  - Need to recover a deleted item:
    - Mailbox, folder, message

- Requirements:
  - A dedicated server
  - Capable of running Microsoft Exchange Server
  - Enough disk space for entire IS
  - Does not need to be part of the same Windows NT domain

Single Item Recovery Microsoft Exchange 4.0 and 5.0

MSTP

- ## Steps for recovery
  - Install Windows NT® Server on recovery machine
  - Upgrade to same NT Service Pack
  - Install Microsoft Exchange with the same org and site names
    - Do not join the existing site
  - Upgrade to same Exchange Service Pack

Single Item Recovery Microsoft Exchange 4.0 and 5.0

MSTP

- Steps for recovery (continued):
  - Restore the information store ONLY
  - Run the DS/IS Consistency Checker
  - Assign permissions to required mailbox or public folder
  - Using the client, copy item to PST

Case: Full Server Recovery

- Problem:
  - Server destroyed or machine upgrade - reinstall approach

- Requirements:
  - Recovery server with same machine name
  - Recovery server must have access to original domain SAM
    - DS dependency
  - Domain controller must be present
  - Enough disk space for original DS and IS

Full Server Recovery

- Steps for recovery:
  - Using server manager, delete, and re-add machine into the domain
  - Install Windows NT Server, using same machine name
    - Install Windows NT Service Pack
  - Install Microsoft Exchange Server
    - Create a new site
      do not join the existing site
    - Use same org and site names
    - Same service account

Full Server Recovery

- Steps for recovery (continued):
  - Install Exchange Server (continued)
    - Install same connectors
    - Upgrade to the same Microsoft Exchange Service Pack as the previous server
  - Shutdown Services and purge existing logs including edb.chk
  - Copy logs from original server if required
  - Using online restore, restore the DS and IS

Case: System Disk Fails

- Problem:
  - System disk fails but other drives are intact; logs are on separate disk

- Steps for recovery:
  - Restore drive hardware and reallocate logical drive
  - Restore NT and all files (including Exchange binaries and NT Registry)

Case: EDB Drive Failure

- Problem:
  - EDB drive is destroyed logically or physically; other drives intact

- Steps for recovery:
  - Set "System Attendant" to disabled to keep Exchange services from starting
  - Restore drive hardware and reallocate logical drive
  - Create subdirectory structure

Case: EDB Drive Failure

- Steps for recovery (continued):
  - Using online restore, restore last full (DS and IS) plus any incremental or differential backups
  - Reset System Attendant; Start services

Case: Log Drive Failure

- Problem:
  - Transaction log drive is destroyed logically or physically;

- Steps for recovery:
  - Disable "System Attendant" service
  - Restore drive hardware and reallocate logical drive
  - Create log file directories
  - Contact PSS

Case: Log Drive Failure

- Steps for recovery (continued):
  - Backup or rename existing EDB file to recover data that hasn't been backed up
  - Restore last online backup of DS + IS
  - Reset "System Attendant" service
  - Move renamed store EDB's to recovery server
    - Repair and start services
    - Run DS/IS consistency adjustment
    - EX-Merge and or Single Mailbox recovery

Case: EDB Corruption

- Problem:
  - EDB corruption is detected via failed online backup or -1018 log event

- Steps for recovery:
  - Restore from backup
    - Recommended solution
  - If no valid backup or circular logging is enabled
    - Backup existing data (file level)

Recovery steps (continued):

- Run repair utilities (EDBUTIL or ESEUTIL)
  - <u>LAST RESORT</u>
  - Could result in further loss of data due to low level page recovery
  - Could take much more time than restoring from tape
    - ESEUTIL - 5-10GB /hr
    - EDBUTIL - 1G / 45 min to 1 hr
    - Then requires ISINTEG - fix
  - Contact PSS

Corruption Causes

- Possible Causes
  - Hardware Failure
    - Write back cache enabled on non-battery backed up controller
    - Turn off any write back on drives themselves since no battery backup exists
    - Power sags or outage
    - Disk, Controller, or Memory Failure
  - Software Failure
    - Bad device drivers
    - System crash

MSTP

- Full online backups fail

- Events in the application log

Event ID: 118
Source: ESE97
Type: Error
Category: Database Page Cache
Description:

   MSExchangeIS ((214)) Direct read found corrupted page (4041) error -1018. Please restore the databases from a previous backup

Database Corruption Precautions

- Disable "write-back" caching
  - On drives
  - On disk controller
  - Could be enabled on battery backed-up disk controllers and hardware RAID5
- Do not place database files on compressed drives
- CHKDSK drives for possible disk corruption
  - Database and Log drives

Case: Total Catastrophe

- Problem: Building destroyed; all servers demolished

- High Level steps for recovery:
  – Establish offsite recovery
  – Obtain offsite backup tapes
  – Restore NT domain from file based backup to identical hardware
  – Restore name resolution infrastructure and connectivity to external world

Total Catastrophe

Recovery steps (continued):

- Restore remote access
  - Invoke pre-arranged dial-up numbers or other procedures to enable remote access
- Restore Exchange servers using full server recovery procedures

Best Practices

Best Practices Backups

- Perform daily online backups
- Turn off circular logging
- Verify backups regularly
  - A disaster is not the time to find out your backups are bad
- Backup the Registry regularly
  - Domain controllers
- Backup KM server data daily
- Periodic file level backups

Best Practices Backups

- Perform full + incremental/ differential backups
  - Sunday - full backup
  - Rest of the week - incremental/differentials
  - Restore time is increased
  - Backup approach is based on business requirements
  - Full Backup every day if possible

- Before restoring, always backup existing log files

Best Practices Verifying backups

- Verify backups periodically
- Procedure:
  - Restore Online backup to a non-production recovery server
  - Start DS and IS

Best Practices Monitoring

- Monitor event logs for errors
  - Errors are reported in the application log
  - Look out for backup errors
    - If found, make offline backups
  - Monitoring utilities in the Microsoft BackOffice® Resource Kit
    - Available at www.microsoft.com

Best Practices Information Store Size

- Determine a practical upper limit
  - Tape drive speed/server hardware
  - 75-100 GB

- Unlimited store size in Microsoft Exchange 5.5 Affects
  - Backup time
  - Restore time (downtime)
  - Time to run utilities

Best Practices

- Mailbox size
  - Setting limits
    - User mailbox/message limits
    - Size limits on connectors
  - Periodic mailbox cleanup
  - Monitor the admin. mailbox for connectors
- Number of mailboxes per server

Best Practices Data Archiving

- Devise archiving plan
  - Allows users to move data from IS to local store files
  - Frees up space in the IS
  - Use local drives or a dedicated server
    - If Microsoft Exchange Server used, you increase required disk space
    - Loss of single-instance store
    - PST stores two copies of each message - RTF and ASCII

Best Practices Tape Management

- Offsite tapes and equipment
    - Some companies policies don't permit this
    - Alternative: send tapes to another site within your company

Best Practices Planning Downtime

- Publish maintenance window
  - Planned maintenance reduces unplanned downtime
  - Critical to set user expectations when they expect 7x24 service
  - Service pack updates
  - Software updates
  - Hardware changes

Best Practices IS Utilities Use

- Use database repair ONLY as a last resort and only AFTER you have backed up the databases and tried a restore!!!
  - EDBUTIL /D /R
  - ESEUTIL /P /DS or /ispriv or /ispub
  - Also MUST run ISINTEG afterwards

  - ESEUTIL /P (Repair a corrupt database) same switches
  - ESEUTIL /d (Defragmentation) same switches
  - ESEUTIL /g (Check integrity) same switches

Best Practices File I/O

- Locate databases RAID5 stripe set; Add swap file to stripe set

- Locate logs on a dedicated physical drive mirror or RAID5 stripe set
  - Improved performance
  - Better recoverability

- Sufficient free disk space
  - Repair

Best Practices Recovery lab / hardware

MSTP

- Isolated network with a domain controller from production network
  - Microsoft Exchange service account
  - Servers with same machine name
- Recovery servers
  - Same hardware as production servers
  - Same drive configuration
  - Same software
  - Sufficient disk space

Best Practices Record Keeping

- Create a disaster kit
  - Operating system configuration sheet
  - Hard drive partition and RAID configuration
  - Hardware configuration sheet
  - Exchange Connector Settings
  - EISA/MCA configuration disks
  - Microsoft Exchange optimize and configuration settings sheet
  - Windows NT emergency repair disk

Best Practices Standardize and Test

MSTP

- Standardize tape backup formats
  - Recovery compatibility with production equipment
  - Test restoring production backup tapes using recovery equipment

- Deploy UPS and test it periodically
  - "If Microsoft Exchange goes down due to a power outage, so will all the other servers"
  - Server class UPS batteries wear out every three years or so

Best Practices Fire Drill Details

MSTP

- Perform a periodic fire drill
  - Single most valuable experience
  - This is the ONLY way to measure your ability to recover from a disaster
  - Use <u>lab equipment</u> but production data from backup tapes
  - Give your staff NO NOTICE of this drill and see how they do
  - Measure time to recovery for scenarios
  - Repeat later & compare results

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Best Practices Server placement / environment

MSTP

- Review environment when placing servers
  - Review room temperature
  - Do not place under fire sprinkler
  - Review amperage and dedicate outlet if possible
  - Locate Microsoft Exchange Server in physically secure area

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Summary

- What it takes: strategies and practices

- How it works: technical review

- Apply knowledge

  – Plan, document, and test

- Ask yourself often:

  What will the business impact
  be if disaster strikes today?

Integration with the Internet and Exchange Clients

Topics

- Exchange Clients

- Microsoft Outlook 2000
  - Configuration
  - Profiles
  - Server Based and Offline use
  - Outlook 2000 as a Collaboration tool

- Exchange Server Integration with the Internet
  - Internet Client Access Protocols
  - Lightweight Directory Access Protocols
  - Outlook Web Access

Communicating With Clients

Clients

Administrator Program

MAPI

POP3

IMAP4

HTTP

Information Store

Directory Service

System Attendant

MTA

Core Components

IIS Server

LDAP
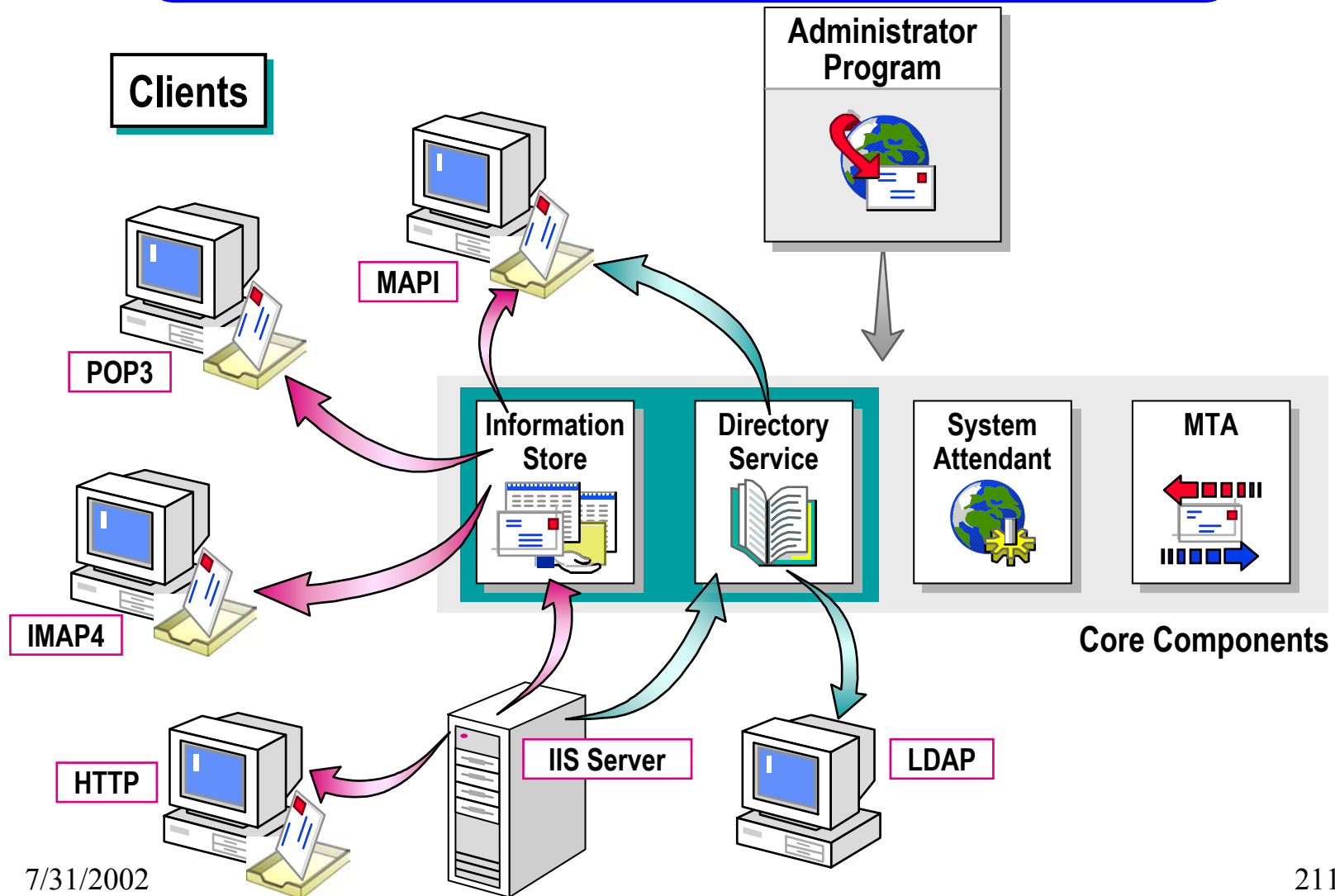
Outlook 2000 Configuration
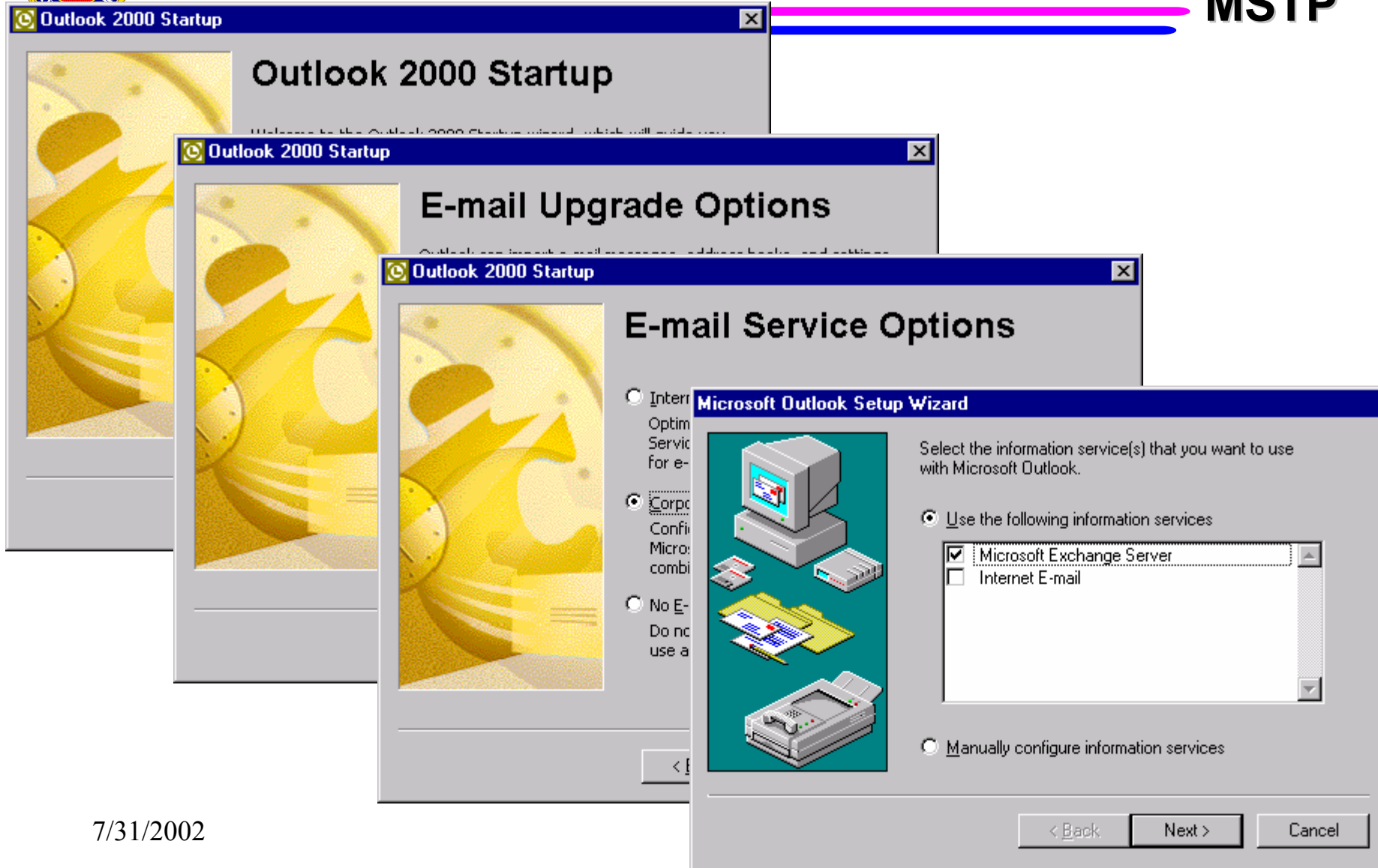
Outlook 2000 Configuration Cont…

MSTP
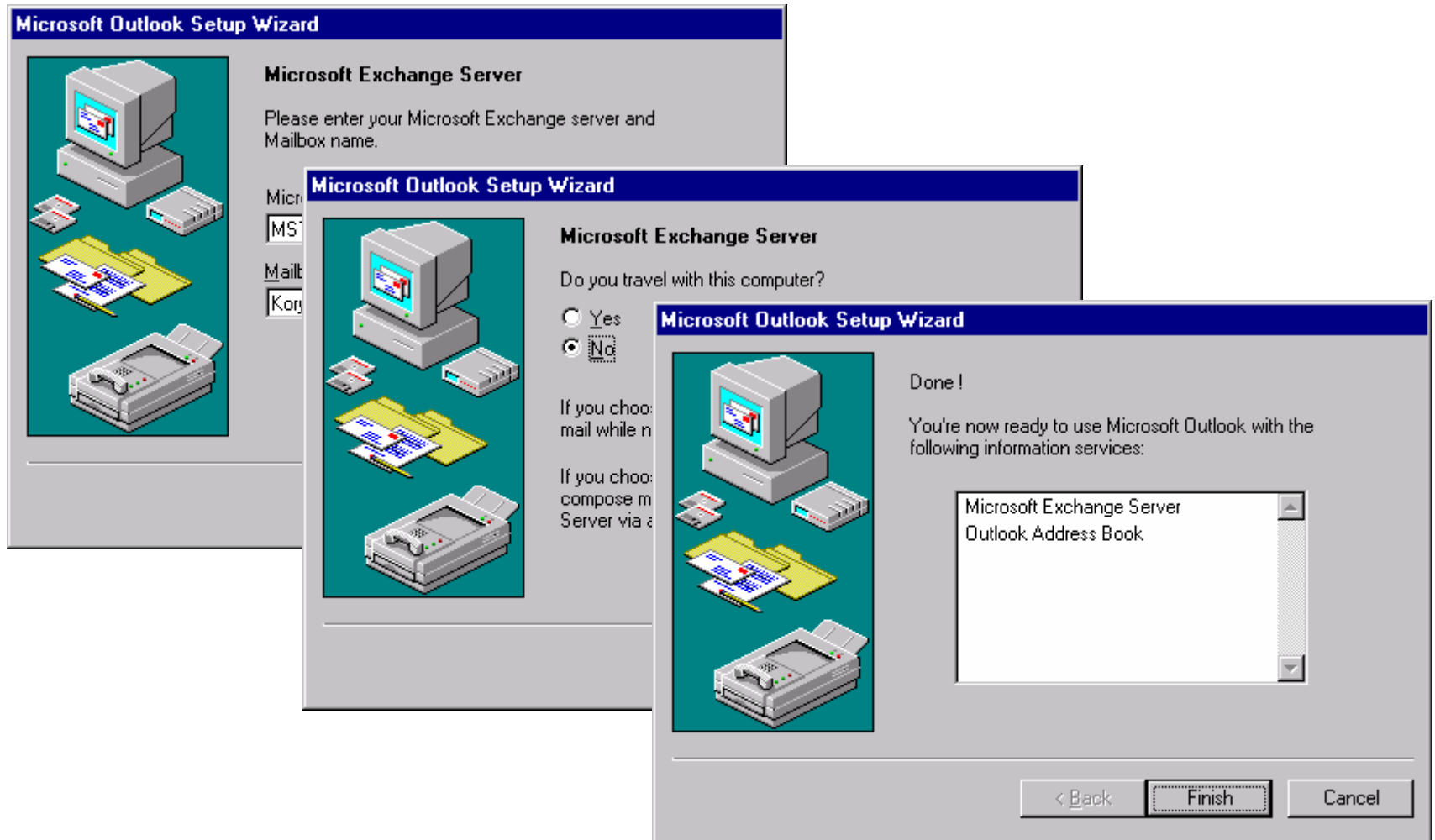
Outlook 2000 Interface

MSTP

Labels pointing to the interface:
- Menu
- Toolbars
- Shortcut Bar
- Info Viewer
- Folder List
- Preview Pane
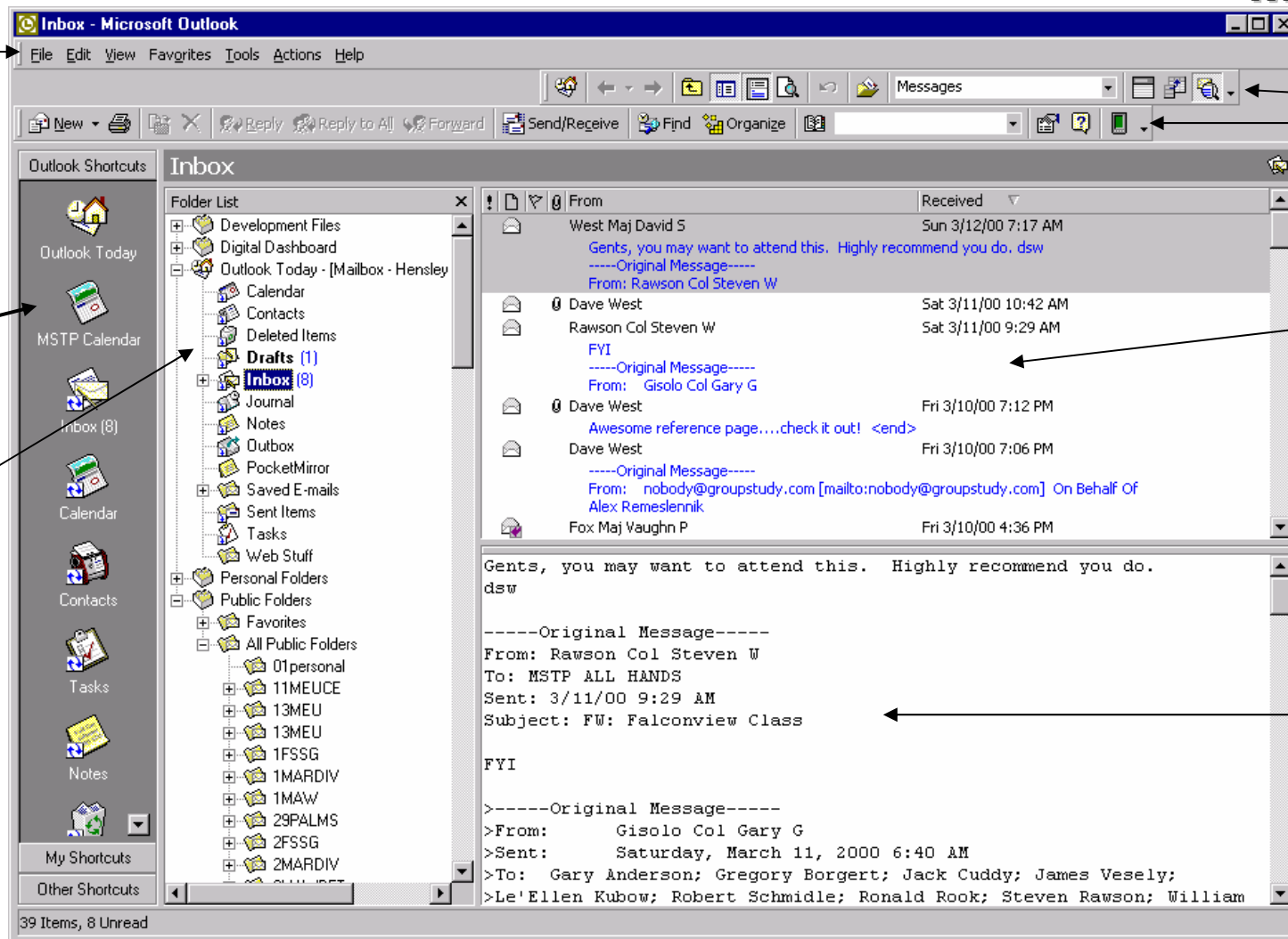
Outlook Profiles

- Tells where to go for information

- Can Have More than one

- Tools -> Services
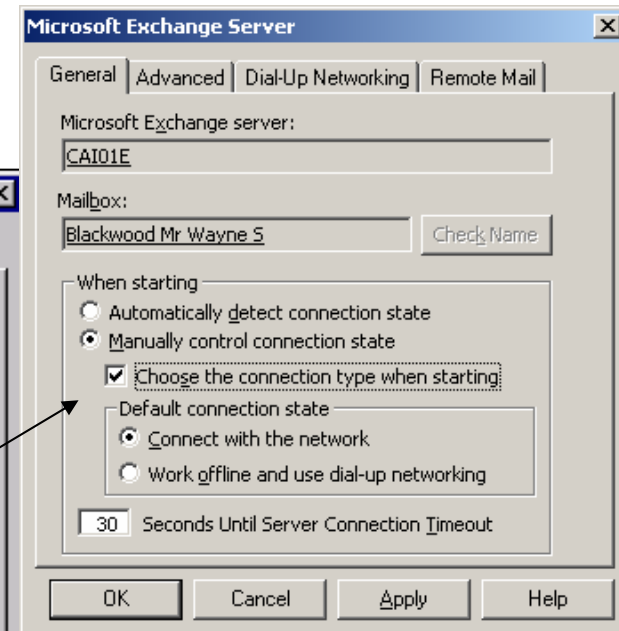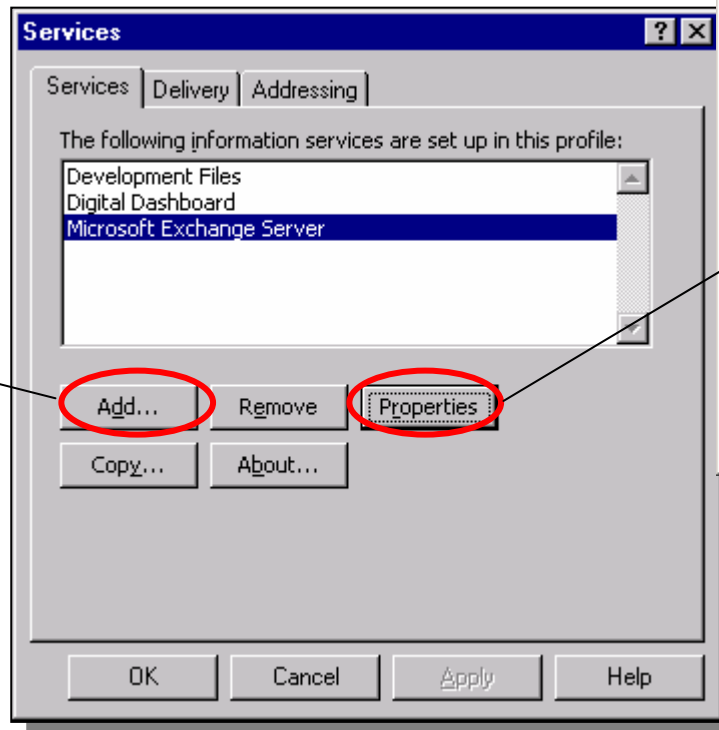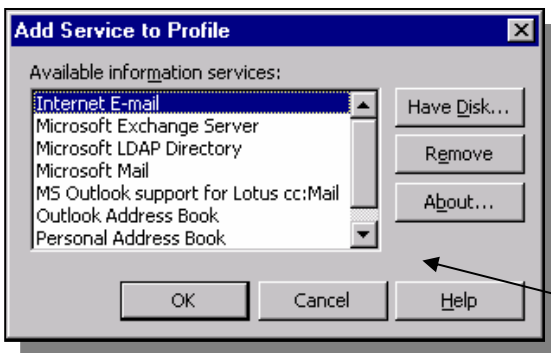
LOCATION OF PROFILE

- MS-DOS Client
  - Install directory of client
    - exchange.pro
- Windows 3.x client
  - Normal users - exchange.ini
  - Roving users - Win.ini add the following:
    [MAPI]
    ProfileDirectory16=<path>
- Win 95 - Located in user's profile
  - Registry \HKEY_CURRENT_USER\Software\Microsoft\Windows Messaging Subsystem\Profiles
- NT- Located in user's profile
  - Registry \HKEY_CURRENT_USER\Software\Microsoft\Windows NT\CurrentVersion\Windows Messaging Subsystem\Profiles

Folders

- **Three Types**
  - **Server Based**
    - Private
    - Public
  - **Offline Store**
    - .ost file
    - On client
  - **Personal Store**
    - .pst file
    - On client

Outlook Shortcuts — Inbox

Folder List

- Development Files → Personal (.pst)
- Digital Dashboard
- Outlook Today - [Mailbox - Hensley Cap
  - Calendar
  - Contacts
  - **Deleted Items** (1)
  - **Drafts** (1)
  - **Inbox** (6) → Private (priv.edb) (may be offline store)
  - Journal
  - Notes
  - Outbox
  - PocketMirror
  - Saved E-mails
  - Sent Items
  - Tasks
  - Web Stuff
- Personal Folders → Personal (.pst)
- Public Folders
  - Favorites
    - TSB Calander
  - All Public Folders → Public (pub.edb) (may be offline)

38 Items, 6 Unread

Creating Personal Folders

Add it to the shortcut bar!

Auto Archive Options

Select Tools | Options
Click Other Tab |
Click Auto Archive
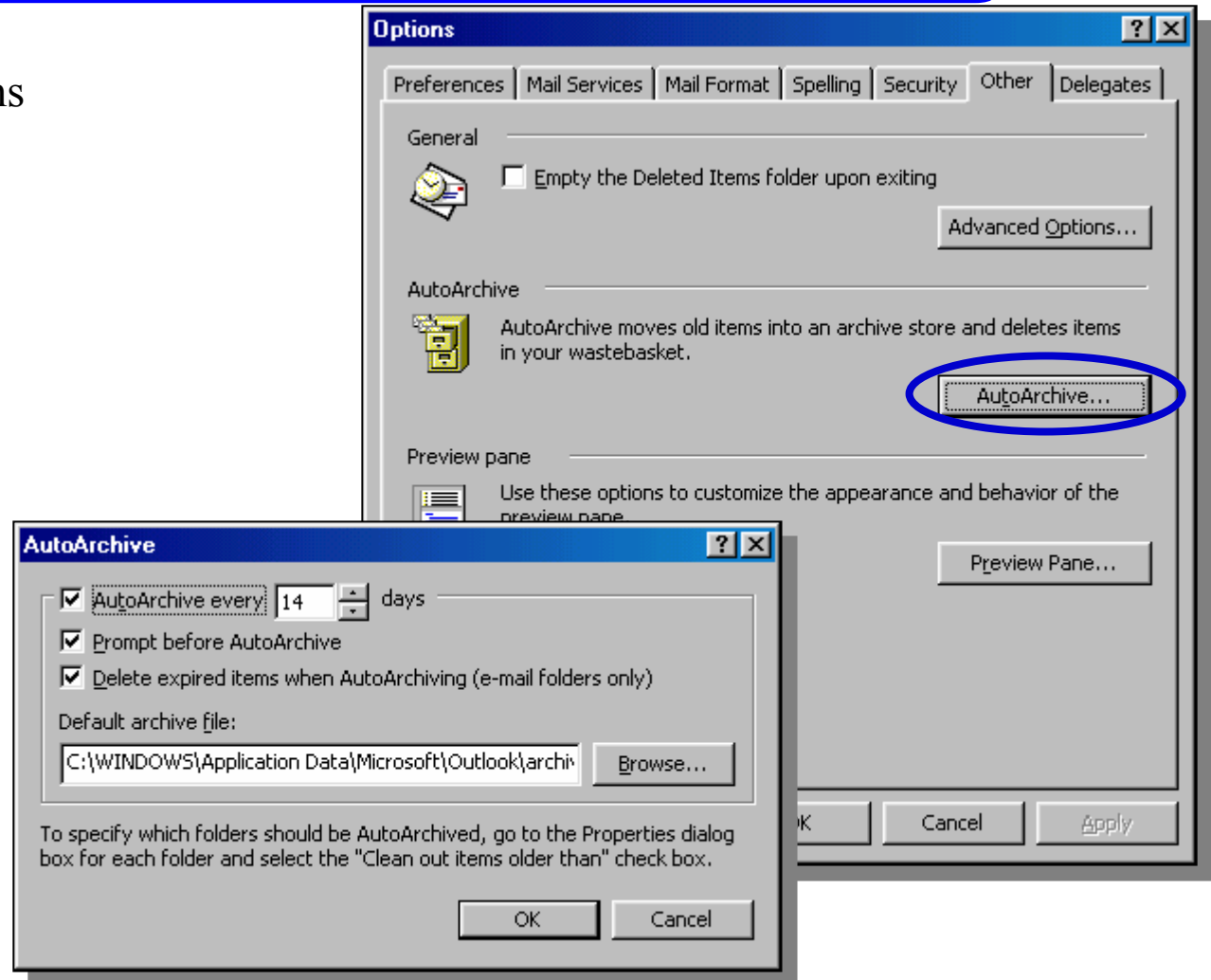
Outlook 2000

Lab #6

Create A Profile
Make Folder Available Off-Line
Create A Personal Folder

20 Minutes

Delegates & Permission

Right-click:

Properties |
Permissions

Microsoft Outlook

Help Topics | Back | Options

Compare Delegate Access, shared private folders, and public folders

You must use Microsoft Exchange Server to use the Delegate Access feature and public folders, and to share your private Outlook folders. The private folders must be stored in the Microsoft Exchange Server mailbox, not in a personal folder file.

With Outlook, you can share items and files in the following ways: you can give individuals permission to see your private folders, make an individual your delegate, and use public folders to make information available to large groups.

Use this	To do this	Examples
Shared private folders	Give one or more persons permission to read, modify, create, or delete information in your private folders.	You want a colleague to see your task list. You want your manager to see your schedule.
Delegate Access	Give someone permission to send messages on your behalf, accept meeting and task requests for you, or manage information in your private folders.	You have an assistant who helps you manage your e-mail messages and your schedule while you are out of the office.
Public folders	Share information with a workgroup, department, or company.	Your workgroup wants to share a task list or post and respond to ideas online in a public forum. Your company wants a calendar where everyone can see the latest holidays and company events.

Public Folders
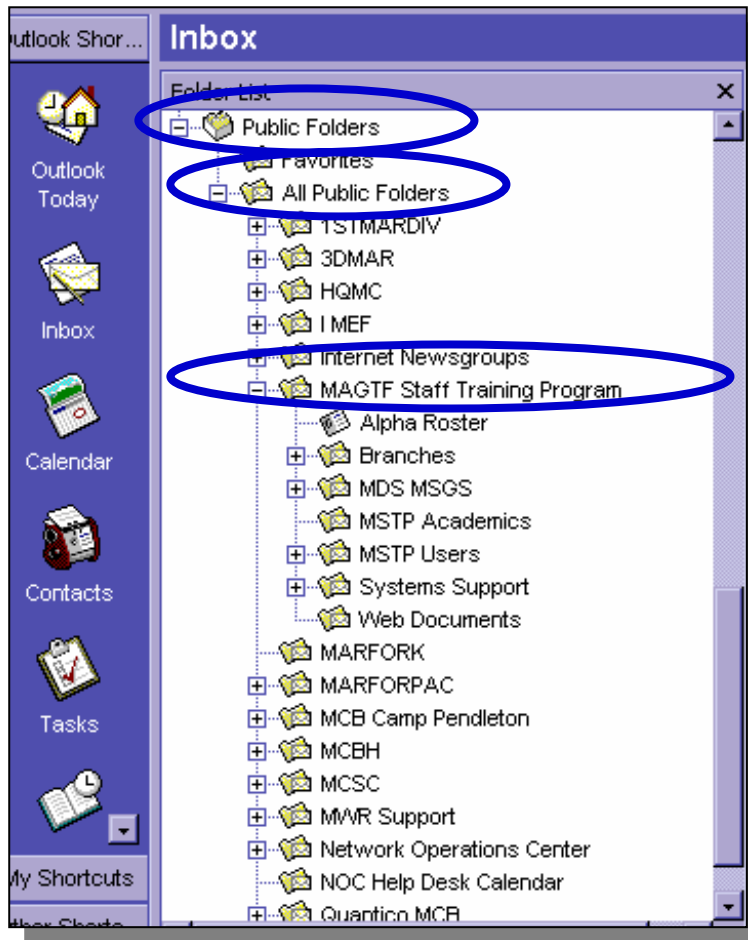
Public Folders:

All Public Folders:

Your Organization

Creating/Deleting Public Folders

- Right Mouse Click

- Select Appropriate action

- Properties
  - Security
  - Forms
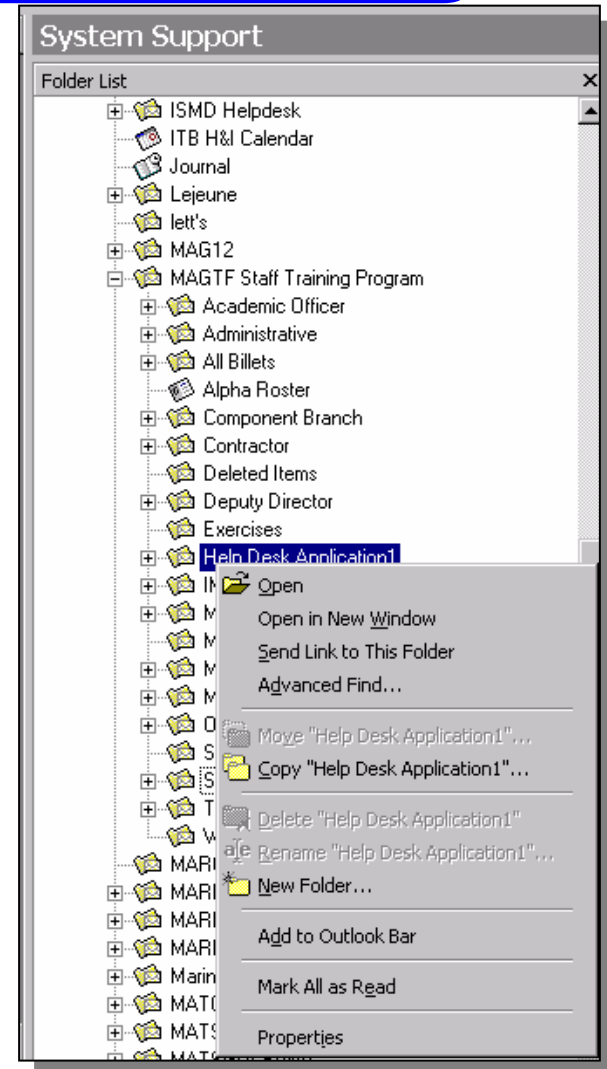
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Right Click Folder -> Properties

Folder Assistants / Rules

- **Right-click** Properties
- **Click** Administration tab | Folder Assistant
- **Click** Add Rule
- (more options **click** Advanced)

Folder Assistant

These rules will be applied to messages as they arrive in the folder:

Status	Conditions	Actions
☐	All Messages	FORWARD TO:Sant...

Move Up
Move Down

Add Rule...   Edit Rule...   Delete Rule   ☐ Show rules for all profiles

Edit Rule

When a message arrives that meets the following conditions:

From...   [   ]
Sent To... [   ]
☐ Sent directly to   ☐ Copied (Cc) to
Subject: [   ]
Message body: [   ]

OK
Cancel
Help
Advanced...
Check Names

Perform these actions: ☐ Do not process subsequent rules

☐ Return to Sender
☐ Delete
☐ Reply with   Template...
☐ Forward   To...   [   ]
Method: Standard

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Public Folder Strategy Single copy

MSTP

- Contents on only one server

- No replication traffic

- Possible bottleneck

- Client must have appropriate Windows NT permissions if folder is located on server in other domain

- No fault tolerance for folder contents
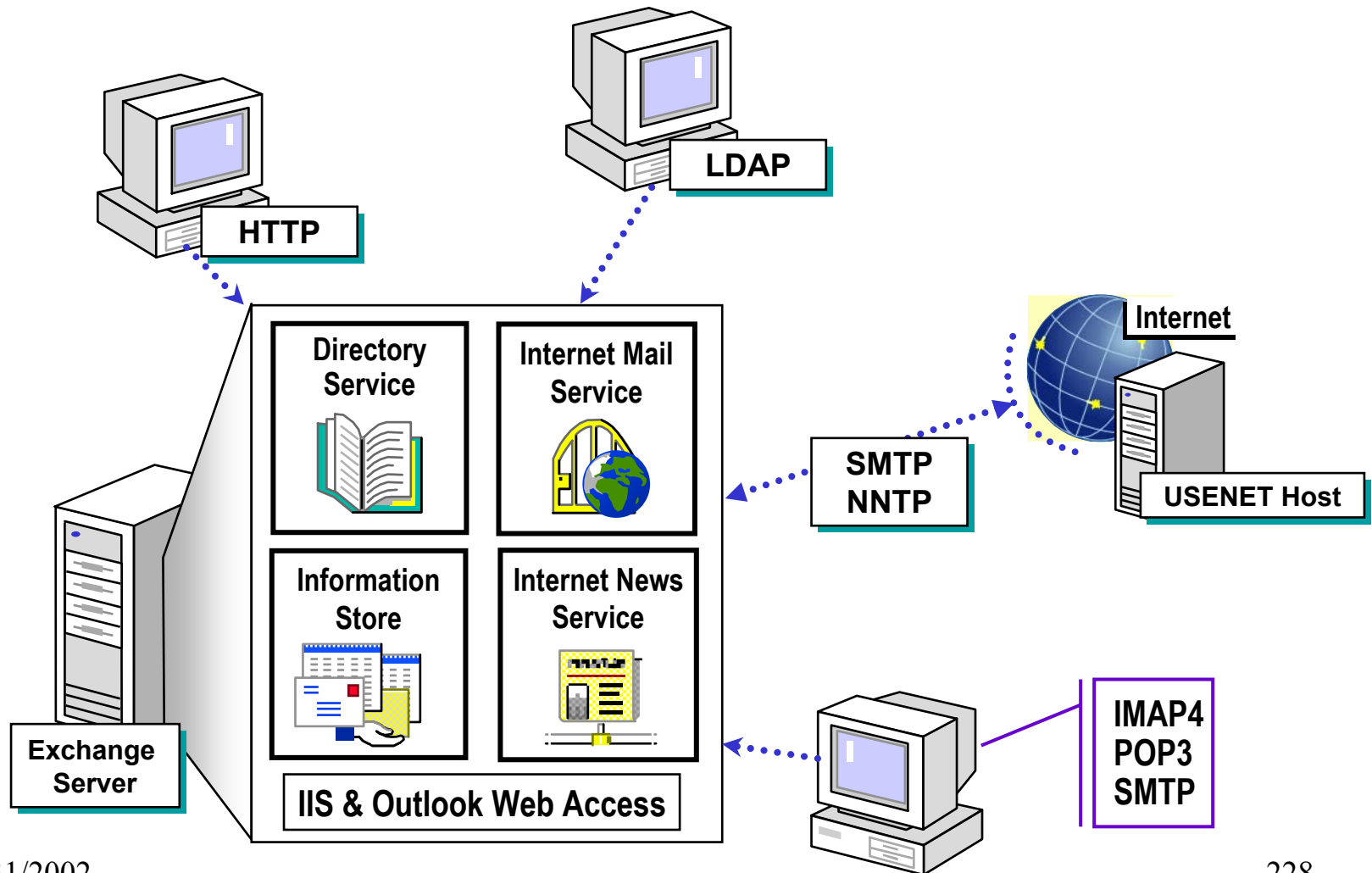
Public Folder Strategy Replicas

MSTP

- Contents on multiple servers

- Load balancing

- Fault tolerance

- Allows access to clients from untrusted domains

- Network and messaging bandwidth for replication processes

Exchange Internet Integration

HTTP

LDAP

Internet

Directory Service

Internet Mail Service

Information Store

Internet News Service

Exchange Server

IIS & Outlook Web Access

SMTP NNTP

USENET Host

IMAP4 POP3 SMTP

Outlook Web Access

- Exchange Outlook Web Access Allows Browser-based Access to a Mailbox +

- Default Setup Requires a Browser that Supports Frames and Java Script

- Requires Microsoft IIS 3.0 and Microsoft Active Server Pages Minimum

- Use the URL of IIS with Active Server Pages to Log On to Exchange Server

OWA Architecture

Internet or Intranet

HTTP

IIS with Active Server Pages

Web Browser

MAPI over RPC

Exchange Server Computers

Server Architecture

MSTP

Browser

Internet Information Server

Exchange Server

Upload	Lang	Active Server Pages

OWA Scripts

CDO

Directory

Store
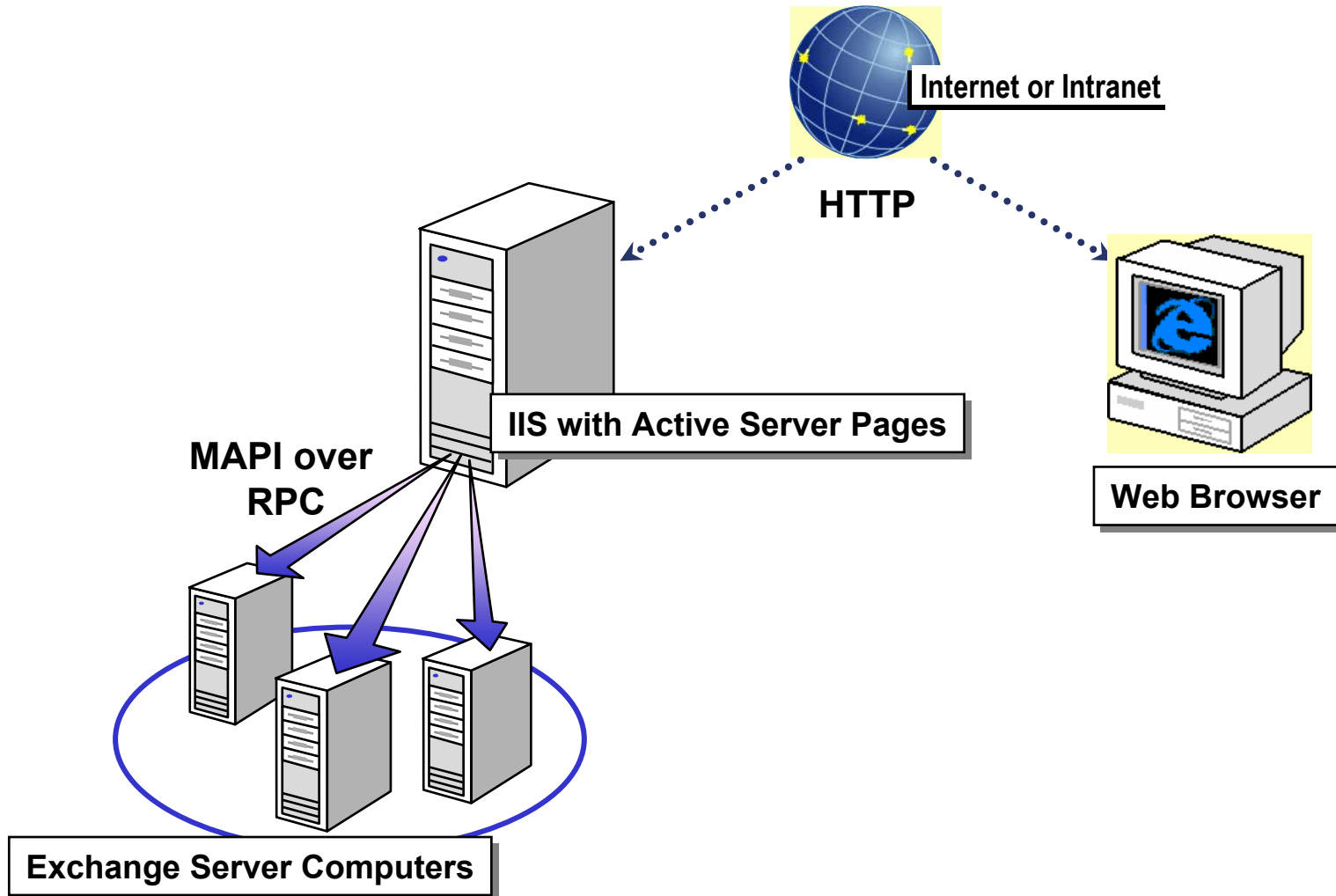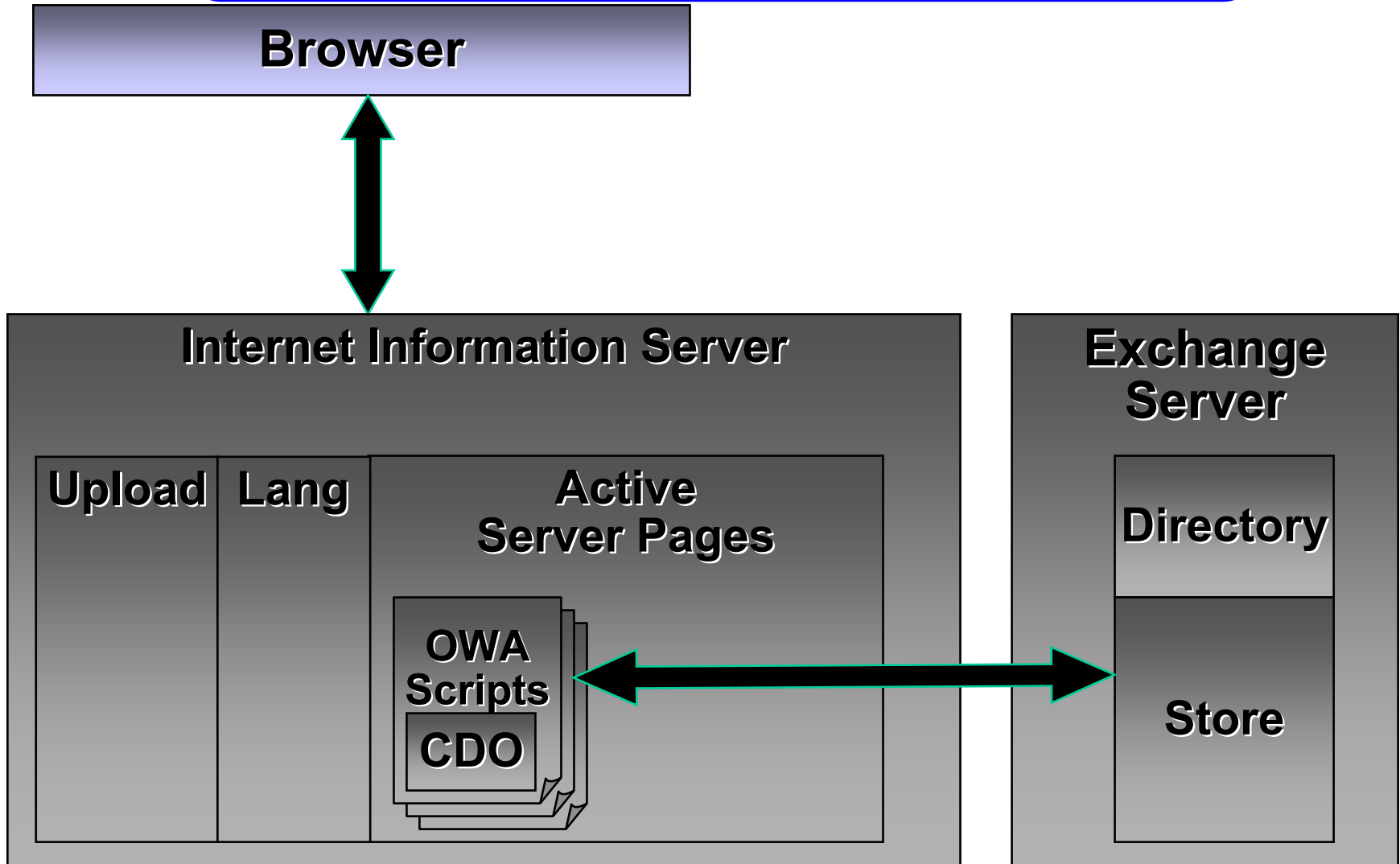
Outlook Web Access

- Microsoft offers Outlook Web access as a feature of Microsoft Exchange Server

- Outlook Web requires no desktop installation - requirements
  - Web browser that supports HTML 3.2 & Java controls

Outlook Web Access

- Web access gives users secure access
  - Basic E-mail
  - Basic calendar and group scheduling
  - Basic public folder access
  - Collaborative applications
- Limitations to advanced features

Accessing Web Access

- From any Web browser, use a Uniform Resource Locator (URL)
  - HTTP:// IIS Server name/exchange
    - Use the Exchange Server name only if IIS is loaded on the Exchange Server

Web Access Logon

MSTP
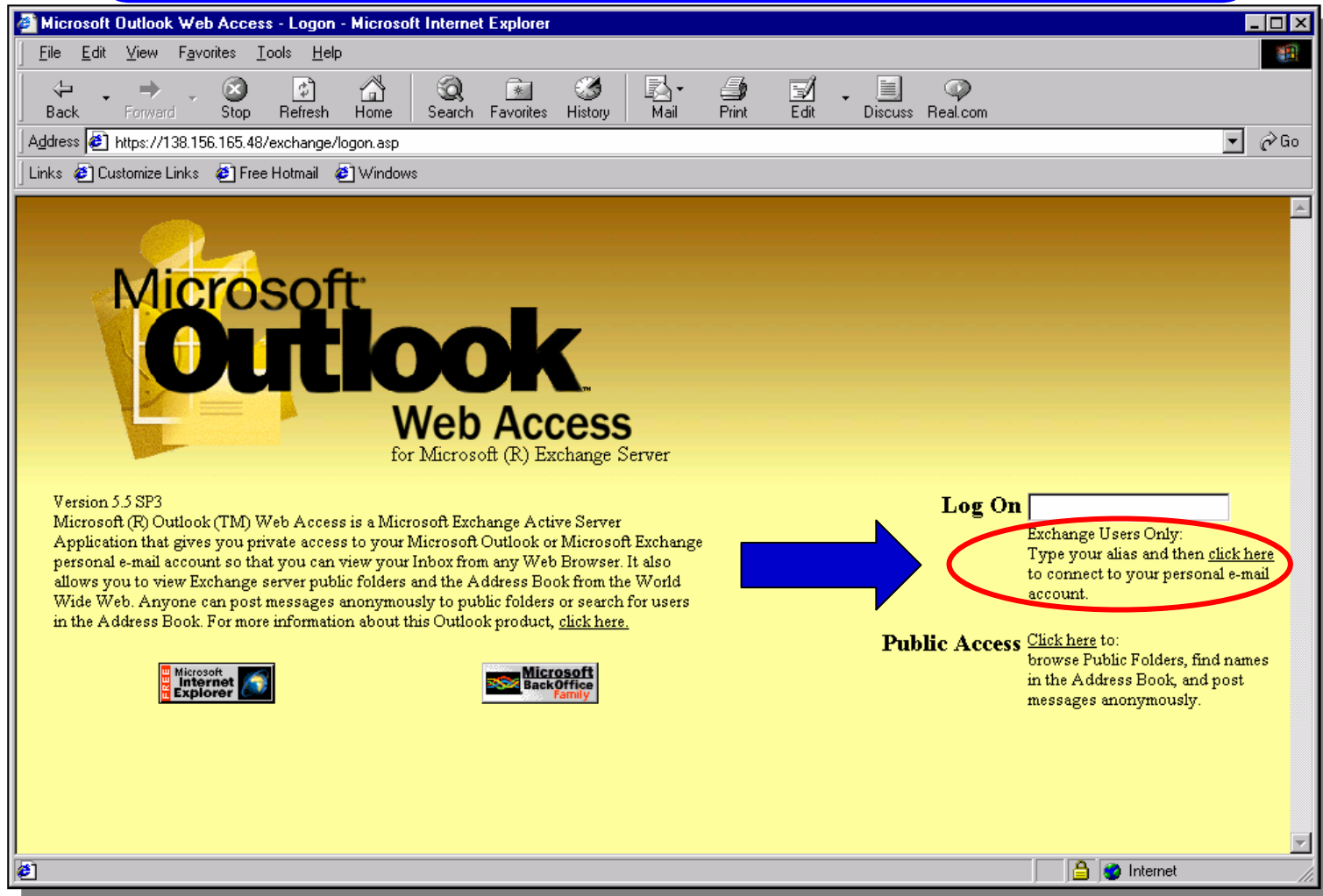
In the Mailbox Name box, type in your alias

Outlook Web Access

MSTP

Anonymous Access

- ## Anonymous Users
  - ## Have access only to items to which administrator assigns access

  - ## Configured from the Exchange Admin program
    - » Access given to Global Address List
    - » Public Folders (must create shortcut)
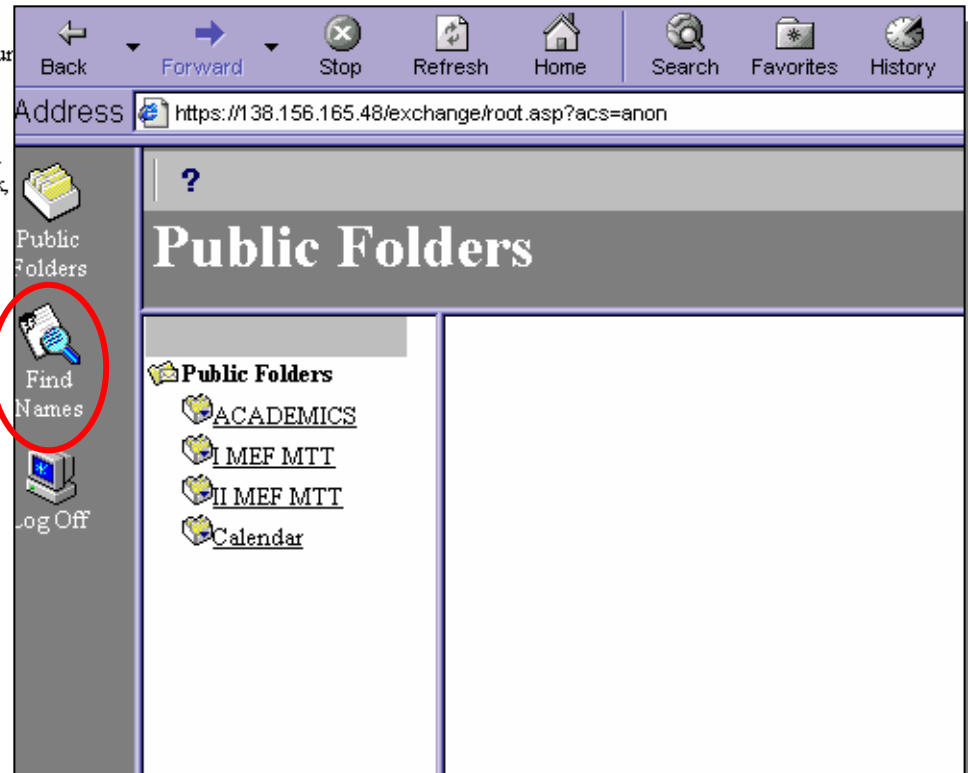
Anonymous Access

Web Access
This is a restricted site intended for only the
MAGTF Staff Training Program.

Log On [   ]

Exchange Users Only:
Type your alias and then
click here to connect to your
personal e-mail account.

Public Access Click here to:
browse Public Folders, find
names in the Address Book,
and post messages
anonymously.

**For anonymous
access, click on
Public Access**

| Back | Forward | Stop | Refresh | Home | Search | Favorites | History |

Address https://138.156.165.48/exchange/root.asp?acs=anon

?

Public Folders

Find Names

Log Off

Public Folders

📁 **Public Folders**
- 📁ACADEMICS
- 📁I MEF MTT
- 📁II MEF MTT
- 📁Calendar

Outlook Web Access

Lab #7
Installing OWA

40 Minutes

Exchange Issues

Putting It All Together

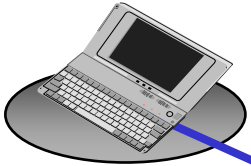# Deployment Complexities

- Topology issues
  - Network security
  - Authentication
  - Capacity
- Operational issues
  - Server interactions
  - Managing user expectations
  - Proliferation of clients
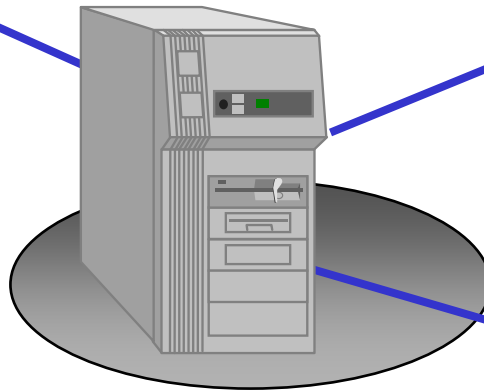 - Kiosk operation
  - Extending/customizing OWA

Planning Network Security
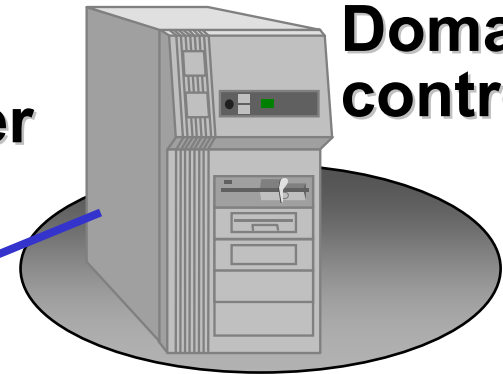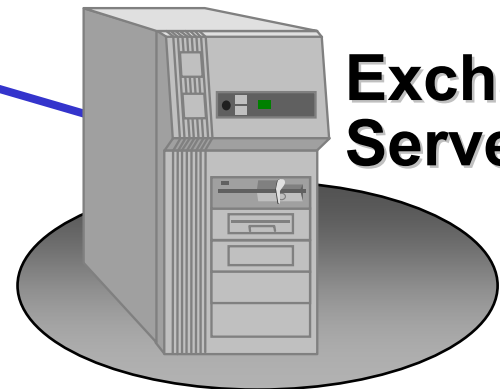
Client

**Internet
Information Server**

**Domain
controller**

**Exchange
Server**

**Firewalls placed
here need to
pass HTTP**

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Client
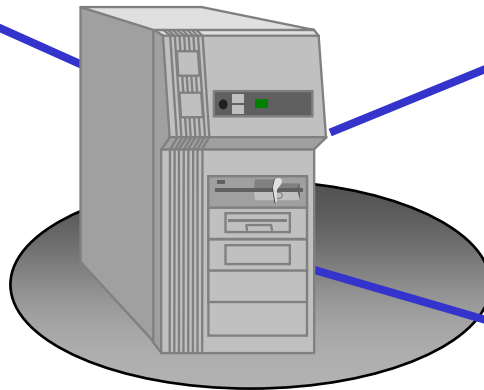
**Internet
Information Server**
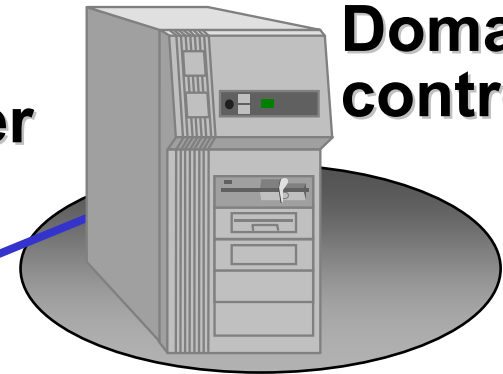
**Domain
controller**

**Exchange
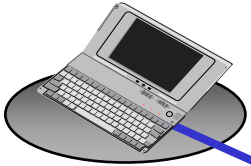Server**

**Firewalls placed
here need to
pass HTTP**
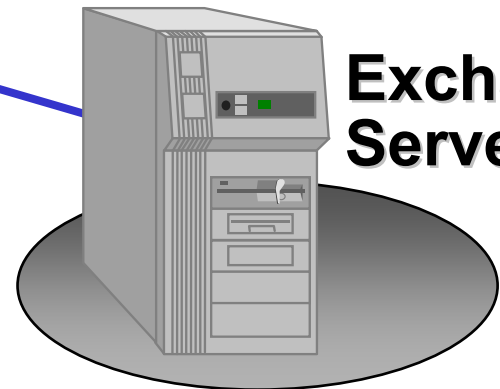
Planning Network Security

Client
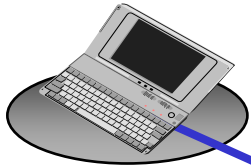
Internet Information Server
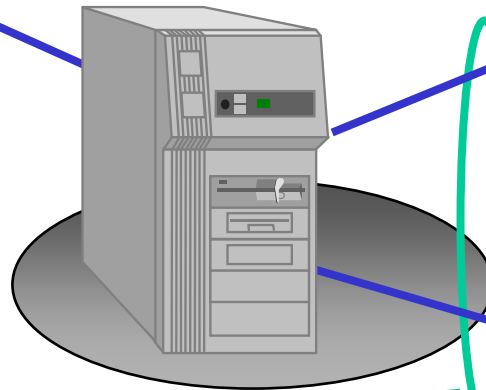
Domain controller
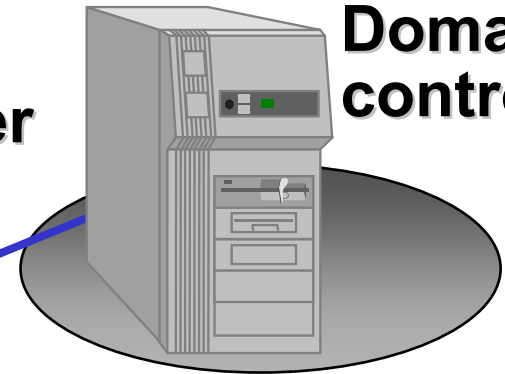
Exchange Server
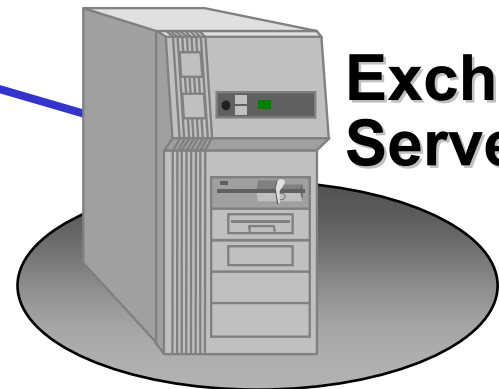
Firewalls placed here need to pass Exchange RPC, and Windows NT authentication

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Authentication Basic

- Pro: Supported by all browsers
- Pro: Can access all Exchange resources
- Con: Relatively insecure
- Con: Authentication popup
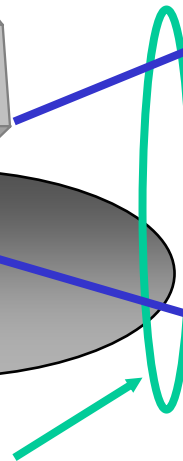
Authentication Basic

MSTP

Clients

Internet Information Servers

Exchange Servers

Clients

Internet Information Server and Exchange, Single Server
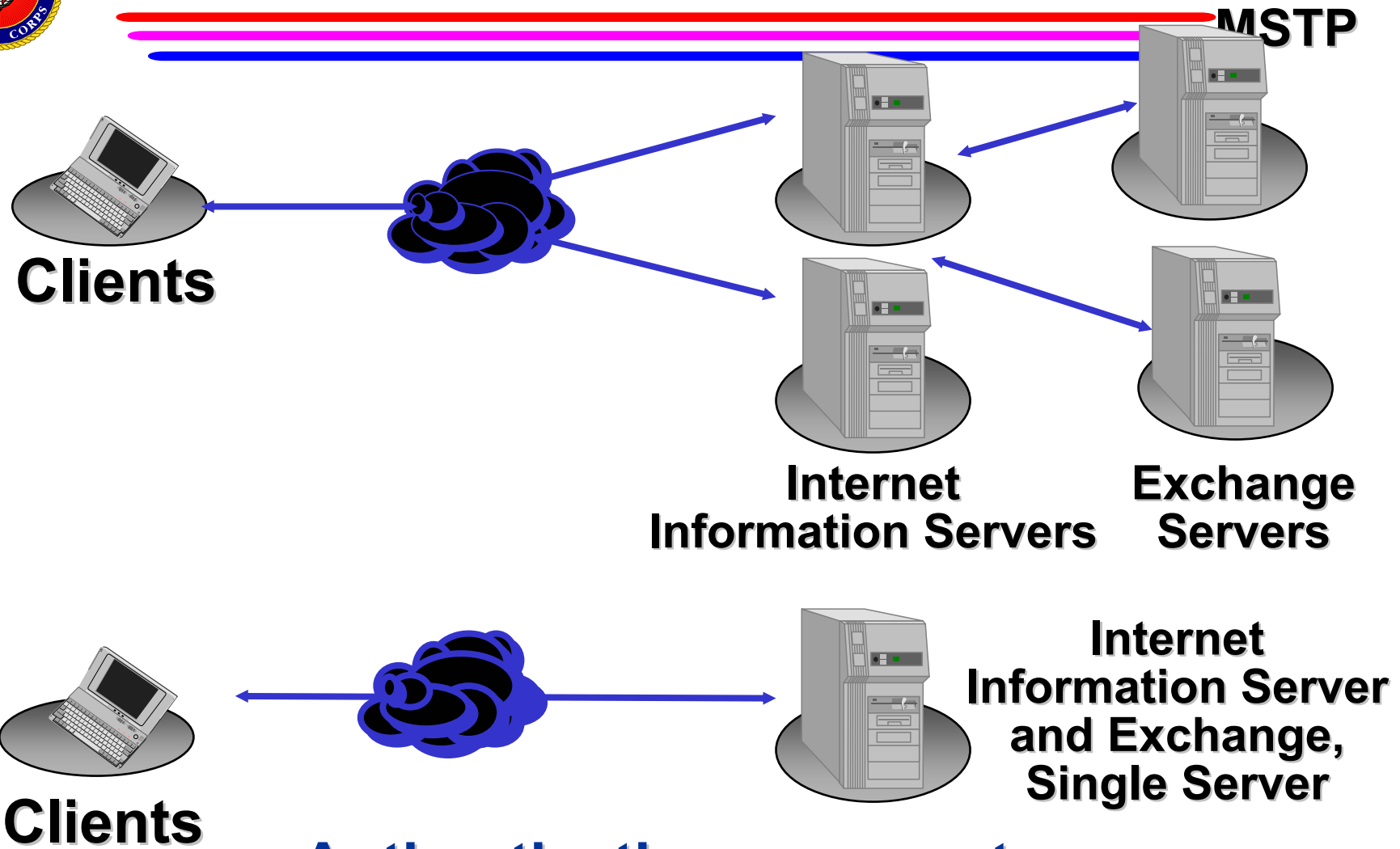
Authentication occurs at Internet Information Server

Authentication Basic over SSL

- Pro: Supported by most browsers
- Pro: Can access all Exchange resources
- Pro: Very secure
- Con: Authentication popup
- OWA 5.5 support is optimized for Internet Information Server 4.0

Authentication SSL

MSTP

Clients

Internet Information Servers

Exchange Servers

Clients

Internet Information Server and Exchange, Single Server
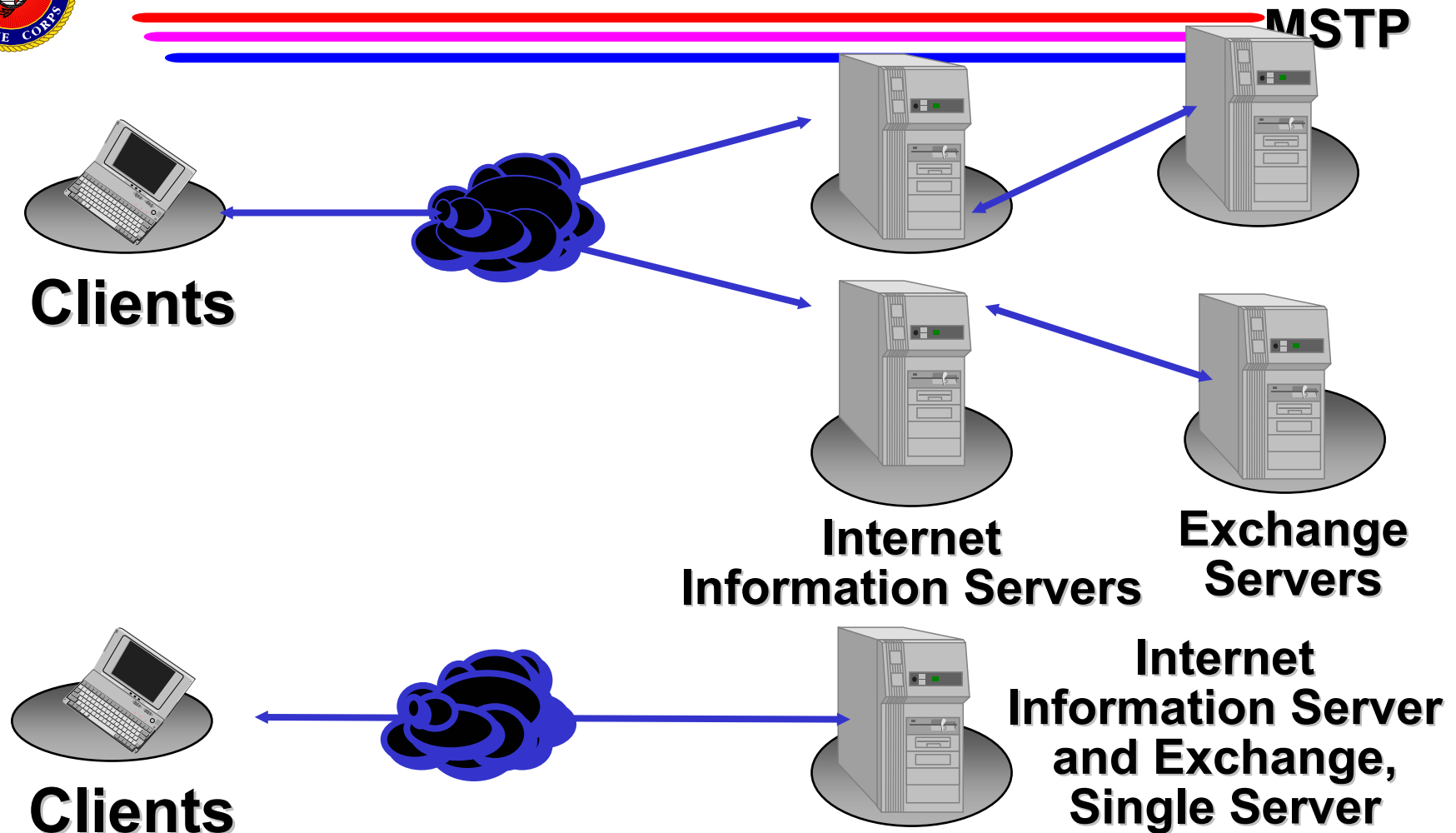
Authentication occurs at Internet Information Server

Authentication Anonymous

- Pro: Supported by all browsers

- Pro: No authentication popup

- Con: No security identity.
  Users may only access
  unsecured resources

- This is a special use of OWA,
  best applied to public-folder and/or directory
  content

Authentication Anonymous

MSTP

Clients

Internet Information Servers

Exchange Servers

Clients

Internet Information Server and Exchange, Single Server

No authentication occurs
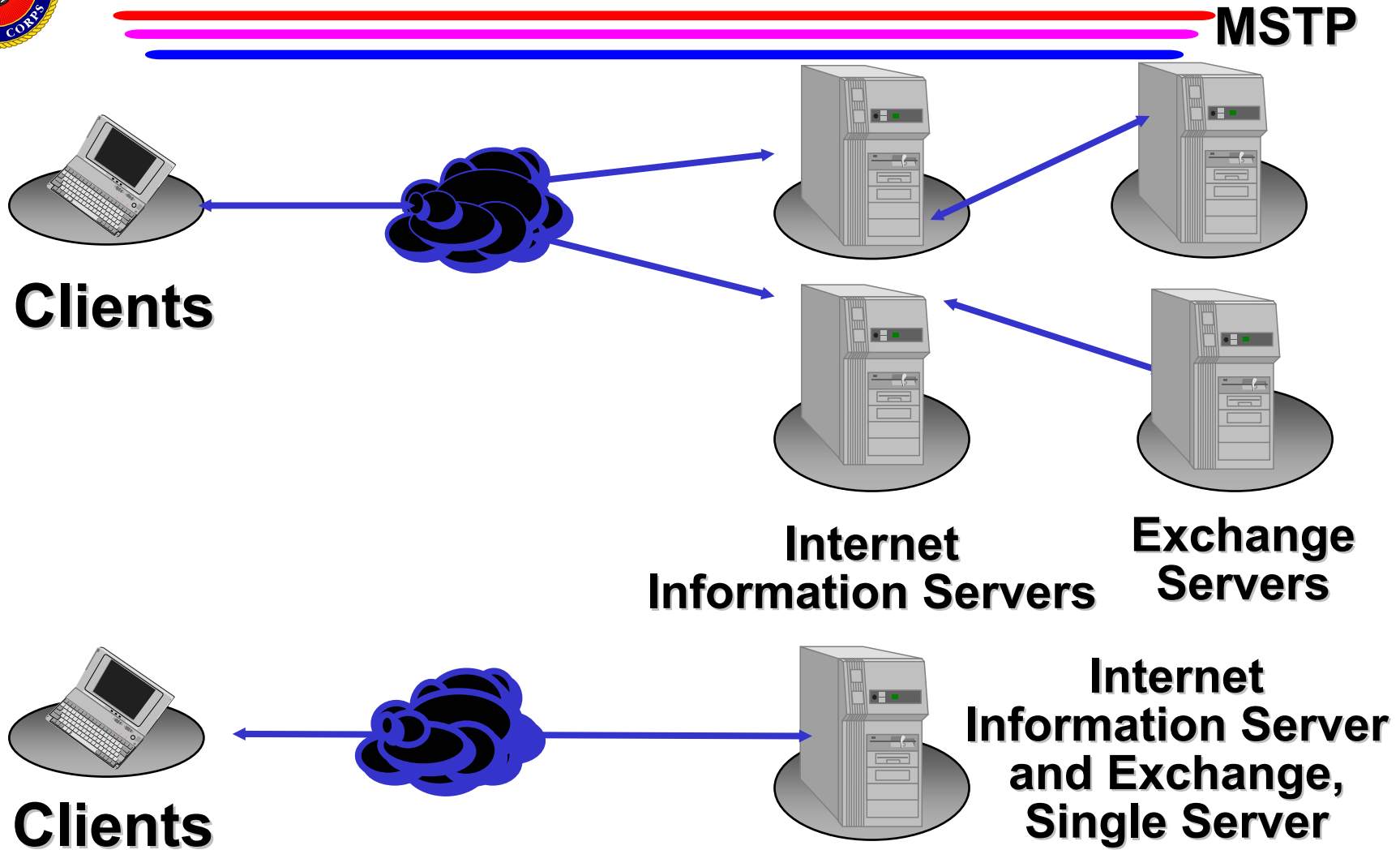
Installation

- Microsoft® Windows NT® 4.0
  - Microsoft Windows NT 4.0
    Service Pack 3 (SP3) Minimum
  - Microsoft Internet Information Server (IIS)
    - Exchange 5.5 is supported with
      Internet Information Server 3.0 or
      Internet Information Server 4.0
  - Active Server Pages
    - Install the Windows NT
      Hotfix for ASP (ASP-MEMFIX)

- Exchange Server
  - Outlook Web Access

Gotchas

- ## The 'Log on Locally' right

  – Each Windows NT account that will
     be accessing the Exchange Server
     via OWA must have the
     Log on Locally right assigned on
     the Internet Information Server

- ## Password authentication methods

  – The WWW service on the Internet Information
     Server must be configured for the appropriate
     password authentication method

OWA Operation

- Managing user expectations
  - UI repainting is slower
  - The "Back" button can cause unexpected results
  - Mouse and keyboard semantics differ
    - Clicking, drag-and-drop, accelerators
  - No embedded OLE attachments
  - OWA is a separate login session with timeout and logout issues

Anonymous Access

- In Exch Admin, open HTTP Site Settings
- Select the 'Allow anonymous users to access the anonymous public folders' check box
- Click the Folder Shortcuts tab
- Click New to add folders for anonymous viewing
- Published folders must have at least Read permission granted to the Anonymous account

Common Issues

- ## Failed to get inbox at logon
    - Authentication configuration
    - Password List (.PWL) corruption
    - Log on locally rights not setup
    - KB articles: *Q167003, Q173451, Q173676, Q175122, Q189654, Q175698, Q174352, Q173470, Q165661, Q166994, Q165987*

Common Issues

- Sorry! The Exchange Server is down or the HTTP service has been disabled by an administrator
  - The HTTP protocol may be disabled…
  - Verify that registry values for the Organization, Site, and Server names of the Exchange Server to which you are connecting are correct
    - HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\MSExchangeWeb\Parameters
  - KB articles: *Q165712, Q173455, Q180417, Q174709, Q167003*

Common Issues

- Access is denied
  - The password may have been typed incorrectly…
  - The username may have been typed incorrectly. Retype the user name, double checking capitalization, and so forth. Use the <Domain>\<Username> format
  - You may not have the Log on Locally right on the Internet Information Server
  - KB articles: *Q169649, Q173470*

Common Issues

- Unable to render view
  424 object required
  - Some required OWA files are missing!
  - Back up the \Exchsrvr\Webdata directory on the Exchange Server
  - Remove OWA
  - Delete the \Webdata directory.
  - Reinstall OWA
  - KB article: *Q178154*

Common Issues

- Unable to render view
  - The following registry keys on the computer running the OWA components have incorrect security permissions:
    - HKEY_LOCAL_MACHINE\SYSTEM\ CurrentControlSet\Services\ MSExchangeWEB
    - HKEY_LOCAL_MACHINE\SYSTEM\ CurrentControlSet\Services\W3SVC
  - KB article: *Q184304*

Take a break!